DOCUMENT RESUME

ED 097 868	IR 001 227
AUTHOR	Kim, Choong H., Ed.; And Others
TITLE	Library Management: Quantifying Goals. Papers Presented at the Fourth Annual Library Science Institute (Indiana State University, Terre Haute, Indiana, April 27-29, 1972). Changing Concept Series No. 2.
INSTITUTION	Indiana State Univ., Terre Haute. Dept. of Library Science.
PUB DATE	Sep 73
NOTE	85p.
EDRS PRICE	MF-$0.75 HC-$4.20 PLUS POSTAGE
DESCRIPTORS	College Libraries; Conference Reports; Data Collection; *Library Planning; *Library Services; Management Information Systems; *Measurement Goals; *Measurement Techniques; Objectives; *Performance Specifications; School Libraries; University Libraries
IDENTIFIERS	*Library Administration

ABSTRACT

Recognizing that the rational determination of priority goals for library services is only possible on the basis of objectively defined quantities, these papers discuss the problems of such quantification. The lead paper reviews current thought on the subject, noting the lack of practical techniques for the disciplined measurement of library processes. Quantification efforts by the national government agency and problems involved in such efforts are the subject of the next paper. Various methods that have been used to determine the future library requirements in support of undergraduate study are described, followed by a review of practical techniques for gathering management data, including methods which have already been tested in academic libraries in England. A proposal is made for a library science paradigm for the handling of subject matters in support of graduate study programs. Quantification problems with regard to school media programs are discussed with the contention that the definition of quality is more important than quantitative standards. The final paper, representing the user's standpoint, explores the difficult problems of defining the library service outcome. (Author/SL)

ED 097868

CHANGING CONCEPT SERIES No. 2

LIBRARY MANAGEMENT: QUANTIFYING GOALS

Papers Presented at the Fourth Annual
Library Science Institute, April 27-29,
1972, Allendale Lodge, Indiana State
University, Terre Haute, Indiana

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September 1973

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IR 001 227

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PREFACE

As librarians, we set many goals for library service. Among these goals are building the library collection, speeding technical processing (often by automation), increasing staff strength and expertise, and providing adequate library space and facilities. Some people view these as basically input goals, while others view them as output goals. Whatever the viewpoint, one usually has multiple or multidimensional goals. Very often these goals are in conflict with one another. An objective of library management is to reconcile these conflicting goals in a manner that most rationally relates to the requirement of the library institution, the staff and the library constituency. Priority goals are determined from various viewpoints and interests--from those of the nation or state, the institution, the professionals, and the library users. Recognizing that the rational determination of priority goals is possible only on the basis of quantities meaningfully and objectively defined and determined, this institute is designed to discuss such quantification problems.

To begin the discussion of quantification, it would be very useful to review the current thinking on this problem. In a leading paper, Mr. William H. Kurth, University Librarian of Washington University, St. Louis, reviewed the current thoughts on the subject. In his conclusion, Mr. Kurth pointed out the lack of disciplined measurement of library processes and the lack of practical measuring techniques by which to study and evaluate the current as well as the future library roles in meeting the need of library users, the present as well as potential library market.

The quantification of national library input and output is essential to help guide the national planning and development of library services. The same applies to each state. Quantification efforts by the national government agency and problems involved in such efforts are discussed by Dr. Frank L. Schick, Chief of Library Surveys Branch of USOE. It is evident from his informal discussion that the federal government agency has launched a systematic nation-wide gathering of library statistics.

From his long and extensive experience of helping the state determine the current as well as future library resources requirements in institutions of higher education, Mr. Stanley McElderry, then Dean of the Graduate School of Library Science, University of Texas at Austin, discussed various methods and techniques that have been used to determine the future requirement of library resources and services in supporting undergraduate programs of colleges and universities. The most promising solution to the current difficulty of getting adequate support for the library is more efficient sharing of resources among libraries, according to his conclusion.

How to gather management data that are essential for effective and efficient management of library resources and services is discussed by Mr. James L. Schofield, a veteran library management expert from the Library Research Unit of the Cambridge University, England. Mr. Schofield brought with him practical methods that have already been tested in a number of college and university libraries in England.

On a fundamental conceptual level, Mr. Alan R. Taylor, then Librarian for African Studies at Indiana University proposed a library science paradigm like other scholarly disciplines have been developing and using to further their understanding and handling of the subject matters. This is in order for university librarians to meet the requirement of graduate programs in universities.

Quantification problems with regard to school media programs are discussed by Dr. Robert D. Little, Chairman and Associate Professor of the Department of Library Science at Indiana State University. He contends that not the traditional quantitative "standards" but defining of quality of "programs" is the most important question to deal with. Finally, representing the user's standpoint, this editor explored the difficult problems of defining the library service output (or outcome). It is obviously impossible to evaluate library programs without defining the expected outcome.

This editor would like to note with regret that the discussion led by Dr. David Kaser of Cornell University Library on library facilities planning is not included in this volume, nor is the discussion conducted by Mr. Irwin Sexton of San Antonio Public Library on management problem of staff supervision. This editor is greatly indebted to many student assistants in the Department who helped him in various ways to make this volume possible. Special thanks are due to Mr. William H. Kurth and Dr. Robert D. Little whose collaboration as members of the planning committee of the Institute had been essential not only in conceiving and making this meeting an unqualified success but in editing and publishing this volume.

The Editor.

QUANTIFICATION OF LIBRARY PERFORMANCE AND THE LIBRARY'S MARKET

William H. Kurth

1. Introduction

The purpose of this presentation is to review a selection of recent studies on the quantification of library goals. Attention is first given, however, at some length to a discussion of the library's "market," that is, the span of users both actual and potential. The first portion of this presentation consists of an explanation of the market and an examination of objectives. The output of the library is then examined. In other words, the "traditional flow" of library work is deliberately reversed; nevertheless, it is our market (its needs, its nature, its extent) which determine our output, and, in turn, the input.

A few selected studies concerned with library output are reviewed. In all of the studies reviewed, the underlying "common denominator" is to get at the relevance of the study to the library market. Is the library in "tune" with the shape of the market?

A few words on vocabulary or definition of terms is in order. A recent ERIC document entitled, *An Analysis of Book Storage and Transportation Requirements of the Five Associated Libraries (August 1970)* was described with the following terms:

1. Cost Effectiveness
2. Decision-Making
3. Management
4. Models
5. Systems Approach

Other related fields or terms include:

1. Measurement
2. Quantification of Goals
3. Cost-Benefit Analysis
4. Systems Analysis
5. Operations Research[1]

Additional areas or terms are:

1. Planning
2. Budgeting
3. Goals and Objectives: Systems Science and Management Science

Even though we may be convinced of the need to apply the principles of cost effectiveness analysis in our libraries, it is useful to raise the question, "Why go about it at all?" It is necessary to check out and define our rationale as clearly as we can. In a way the cost-benefit analysis is put upon us rather drastically in the academic library community by virtue of the increased competition for the parent institution's limited financial resources. Robert F. Munn puts it, I think, concisely:

> "One important consideration is the fact that many academic administrators view the library as a bottomless pit. They have observed that increased appropriations one year invariably result in still larger requests the next. More important, there do not appear to be even any theoretical limits to the library's needs. Certainly the library profession has been unable to define them.
>
> "This the administration finds most disquieting. The science chairman may request staggering sums for equipment, but at least they have a definite and perhaps even attainable goal in mind. It is possible to imagine that with an assist or two from the National Science Foundation, the physics department might reach the point where it has all the equipment it wants; another reactor or accelerator would actually be in the way. Even the athletic director will admit, if pressed, that it would be absurd to build a field house above a certain size. Only the librarian is unable to place any limits on his needs.
>
> "All this presents even the most 'library minded' administrator with a real dilemma. His long-held article of faith that the library is a 'Good Thing' and somehow self-justifying are questioned. The young men are contemptuous of article of faith. Even the fact that the prestige universities tend to have the largest libraries leaves them unmoved. They point out that this is simply a result of wealth, and that the prestige universities also have the best student psychiatric services.
>
> "In short, the conventional wisdom is simply no longer useful in the area of resource allocation. It does not, for example, help the administration determine whether an additional $100,000 a year would be better spent on books or on the addition of new staff in the department of civil engineering.
>
> "The current pressure to introduce modern management practices into the universities will not leave libraries unaffected. Such techniques as program budgeting require a much more rigorous analysis of the balance of return against investment than has ever been applied to libraries. Just why should the library receive 3 or 6 or 10 percent of the institution's total budget? How should the claims of the library, the computer center, and educational television for budget support be evaluated? These and similar questions are certain to be asked. It might be prudent for academic librarians to have some answers."[2]

Somewhat the same rationale is put to the public libraries. The question raised in a recent study of library service in Indiana cause us to ponder. The authors of *Economic Aspects of Library Service in Indiana,* Richard L. Pfister and Jerome W. Milliman say it in these terms:

> "Public library officials should begin to think in terms of benefits and costs of the services they provide. How much are the benefits of library service worth? What is the costand how are the costs and benefits distributed? What groups (income, social, age, etc.) benefit most? What groups bear the costs of providing library services? Can the objectives of public library service be all-inclusive as to insure that every person should have a level of library service that meets his needs without a careful consideration of benefits in relation to costs? Is it desirable to support the position that public library services should be provided universally to all Indiana residents without also making an attempt to show the benefits in relation to costs? It is possible that the provision of free library services to some users may not be either efficient or equitable. Are there other cheaper, more equitable ways to perform some of the services now supplied by public libraries? For example, what are the best ways to purvey popular fiction to adult readers?"[3]

At the same time these questions are squarely put to us, we find libraries concerned with formidable questions affecting their future; these questions range from the effect of inter-library cooperative arrangements, the implications of computerization in various forms, the rapid growth of collections, the continuing development of area programs, the place of the new media services in relation to the library, as well as the shock of recent financial reverses. These concerns and the rise of "hard" questions dealing with objectives, I suggest, are not entirely unrelated.

Often we provide the equivalent of definition by citing an example. The foregoing statement could readily be offered as a response to the query, "What is cost-benefit analysis?" Here is a technical definition: "...that procedure by which the costs of alternative means of achieving a stated effectiveness, or, conversely, the effectiveness of alternative means for a given cost, are compared in a series of numerical indices. The objective of the analysis is to isolate the alternative or combination of alternatives that either gives the greatest expected effectiveness for a given expected cost or a given expected effectiveness for the least expected cost."[4]

Another way to define cost-effectiveness analysis is to list the ingredients that comprise it.

1. Objective(s)
2. Alternative means or "systems"
3. Costs of resources required by each system.
4. A mathematical or logical model, a set of relations among the objectives, alternative means, environments, and resources.
5. A criterion for choosing the preferred alternatives usually relating objectives and costs.

By objective is meant the establishment or determination of the purposes of the alternatives among which we wish to choose.

The second ingredient... is the heart of these kinds of analyses. The philosophy simply is that there is a choice, that objectives can be reached by alternative means, and that the problem is to discriminate among alternatives and select the preferred alternatives.[5]

We could organize a discussion on cost-effectiveness analysis of libraries by beginning with input factors (acquisition, cataloging), in other words, following traditional library organizational pattern, dealing then with output factors such as reference and circulation. However, here we will invert them and begin with the output; in fact, before we take up output, we'll discuss market analysis dealing with the users of the library, both actual and potential. It is, after all, the market--that is to say, the nature and extent of the user group which ought to play a decisive role in the determination of the library's output. Once output is defined and described, we can turn to input factors, for these are largely determined and shaped by output.

Last year's seminar session here at Indiana State University was "Man-Material-Service." The Service (or output) was the raison d'etre.

The essential characteristic in all of our work in management of libraries, in quantification of goals, in cost-benefit analysis and other investigations involving the use of data is the standardization of our statistical terminology. The accomplishments and work of the National Center for Educational Statistics, American National Standards Institute, UNESCO, etc., may be mentioned here not only toward the development on a national basis but leading toward a truly international lingua franca.

The need for such standardization is rather neatly put in 19th century English by John Eaton, Commission of Education:

> "The extreme diversity in the manner of conducting the business and keeping the records of education institutions of all classes in the country rendered that harmony of results essential to useful comparisons and correct inference difficult of attainment, and required (a) sound discrimination in selecting the points of the various systems concerning which libraries should be addressed; and (b) great care in devising nomenclature, which, suitable for general adoption, should mean the same to all."[6]

Time after time one encounters a phrase such as the following: "The lack of detailed comparative data became apparent when an analysis of the use of staff and personnel expenditures at the UNC Library was made. It was impossible to determine if the expenditures and staff for functions and departments were reasonable since there were no data from other libraries."[7]

Any discussion of quantification of goals presupposes another necessary ingredient: standard times. This is basically the careful description of specific tasks and the elapsed time in their performance.

This is stated concisely by Bourne and Kasson.

> "Relatively little objective and transferable time or cost data is available in the library field to describe the effort required to perform specified repeatable tasks or to provide specified services. For example few library administrators know their cost per circulation transaction, or cost per book acquired and cataloged in their own facility. Furthermore, those that do know are unable to compare them meaningfully with the costs that are reported for other facilities.
>
> What is needed is the careful preparation of a collection of normalized standard times and costs for repeatable library operations, written and documented in a form that would permit their utilization and extrapolation in a wide variety of library situations. The availability of such data, properly derived and documented, would benefit the operations, designs, and administrators of many library systems. Data furnished in this way would facilitate: (1) its direct use in whole or in part by others for comparison of alternative approaches; (2) its use as part of library management and evaluation efforts; (3) its use as a model or framework for the data collection and reporting of others..."[8]

Dougherty spoke of this when he said:

> "I recommend that ALA establish a task force to develop a methodology for collecting, organizing, and disseminating standard time data. Until the profession performs this laborious, unglamorous type of spade work, we are only deluding ourselves when we talk about developing comparative costs and statistics."[9]

The need for definitions and for standard times is, of course, to improve the chances of communicating the message. One of Theodore Bikel's stories illustrates this nicely: it seems that a Texas rancher, in Israel, wanted to see the nearest equivalent to a Texas ranch. An obliging Israeli took him in his car to the boundaries of his "ranch." The trip lasted only a short time; the Texan couldn't restrain himself at the relative smallness of the "ranch," and blurted out: "On my ranch I have to drive, drive, and drive, and then I get to the end of my ranch. To this the Israeli, with the greatest of sympathy, is supposed to have said, "You know, I used to have a rotten car like that, too."

II. MARKET ANALYSIS

We start with remarks about the nature and extent of our library market, its characteristics, and the relationship we ought to have to it. We might also ask ourselves whether the market is an exclusive one or whether we indeed share that market with other providers of information.

Are we concerned solely with the present users? Decidedly not. The critical self-examination posed here is to break out of the constraint of present users context.

By the nature and extent of the market we mean the number of people in it. An examination of characteristics will help to determine whether we face a rather homogeneous or variegated field. Much of this paper is concerned with a university or "multiversity" to use Clark Kerr's word, hence our market is at once varied and diversified.

This is, in fact, a good term for us. The larger academic library is used by a variety of users with unique attributes; in reality we seem to have a collection of special libraries in a university. This factor is of great importance in analyses and management in order to avoid too much dependence upon general findings ostensibly valid for the entire library.

Why should we bother with broadening the horizon to get at market analysis which will include non-users of the library? For one thing to test and probe to ascertain what information needs exist and how they can best be satisfied; thus, it is probably a mistake to restrict out "net" to those who happen to use the library. We want to find out what the limits or real bounds for library functions are. The true universe, for the university library, might be the entire body of students, faculty, and administration, in terms of groups, and in terms of teaching (or instructional) research, as well as administrative needs for information, and for some constitutions, segments of the community.

It is necessary to consider the market as a whole, as well as its peculiar parts to determine how the job of information can be handled in the best way. What might this do for us? It might result in a better job being done for the present users, at least for some of them. Perhaps there are even some present users who ought not to be users.

The distinction between the present and the potential user is underscored by Churchman.

> "We have gradually beguan to realize that the real user may not be classifiable in terms of his true need for information, except in the relatively unimportnat cases of routine or bureaucratic retrievals. If the real user is unique in some very strong sense, then 'classification' may only touch on the superficial aspects of his needs."

> "Another way to say the same thing is that to restrict library user studies to those who actually come into the library may be a mistaken approach. Perhaps the most important group of people are those who would use the library provided certain policies are changed; for example, studies of book circulation may seriously miss the mark."[10]

Our concern with the wider "market" is commented on also by Vickery in his introduction to the Slater Study:

> "Library planning cannot rely solely on studies of library use. In the first place, account must be taken of alternative methods of document provision. It may or may not be more efficient to provide every bench scientist with a copy of *Handbook of Chemistry and Physics,* or every student with money to buy books, rather than increase library provision. Secondly, librarians must view all users of information as potential customers, and must take note of the results of wider surveys that go beyond those who actually visit the library."[11]

> "We all know from experience that some scientists prefer to consult people rather than documents. The extent to which they approach people first, or by-pass libraries altogether, has been estimated by various observers, and figures between 25 percent and 50 percent have been reported. ASLIB found that about a third of the people who finally turned up in the library on the test day had tried to get the information they needed somewhere else first. These individual figures are not in themselves important, but they do indicate that, for whatever reason, a substantial number of the people who need information do not seek it first, or at all, in libraties, although the specific function of libraries is to provide information."[12]

This simply underscores the variety of ways in which information is acquired. The following quotation is of interest, not only for what it says, but also with respect to the manner in which it is stated--implying a disinclination to utilize library services as currently structured:

> "Some biologists attempt to circumvent the problems associated with the formal use of libraries by attempting to keep abreast of current work via extensive reprint exchange."[13]

Some of the non-library sources are:

1. Meetings: informal and formal
2. Information exchange groups
3. Circulation of manuscripts prior to publication.
4. Newsletters and other ephemeral publications (received directly). Journals received directly too, account for "transfer" outside library reading rooms. We have to remind ourselves that the need for information is expressed variously by different persons representing a variety of disciplines.[14]

A propitious area for investigation are the boundaries between library and non-library information transfer. Such studies could look into:

1. Where and when does it make sense for faculty and students to do their own document gathering? What is the "break-even" point? The general collection, reserve room stock, and the campus bookstore comprise the factors for boundary description and complementation.

2. Relationships between other on-campus information centers such as the computer center, audio-visual instruction centers, TV, etc. and bookstore relationship (mentioned above but in the context only of reserve).

It is of interest that the Raffel and Shishko study of the MIT Libraries mentioned on page 67 that the benefit survey indicated that the library should use current reproduction technology and paperback books to encourage people to use library materials outside the library.[15]

To what extent should the library frown upon the rise of reading rooms on campus? Is it necessarily a reflection of library inadequacy that such reading rooms arise? Should they be encouraged? All of these are questions intended to "open up" the discussion of the library's objectives and functions.

It is, of course, a fair question as to what extent the university libraries can alter the university's face; in other words, do not any alterations on campus have to occur in the presidential or chancellor's office? Ordinarily the librarian has to accept the situation as "given" and proceed narrowly to "make things work better" within the existing environment.

One ought to make a distinction between user needs and the expressed demands of the user. Slater, for example, in her survey, makes the point of the "exploration of the needs underlying demands and the extent to which demands reflect needs and/or external factors."[16] This is an attempt to look into the user's mind. Hanson observes, "But real needs are extremely difficult to explore and in practice much of the investigations have been of users' actions, and of their expressed demands, which is not quite the same thing."[17]

Real needs and users' actions are often blurred in our various surveys. Another aspect illustrative of difficulty in securing hard information on behavior is discussed as follows.

"Professor Bernal pointed out again in 1958 a difficulty which was raised by a scientist answering his questionnaire in 1948. The argument is:

> 'The essential difficulty is that, though the user may well know what he wants from an information service, he is in no position to know what he needs from it, namely what variation in the system would help most to further his work. Consequently, any action based on an analysis of present user habits is unlikely to produce impressive results.'[18]

Hanson comments further on the factors which constitute this area of behavior:

> "What kinds of information scientists take observable steps to obtain; of where and how often they seek information, of the demands they make on libraries--these have been the actual subjects of most researchers on users' needs. The results reflect real needs, and although they are only partial reflections we should use them for what they are worth while we try to develop research techniques which will enable us to dig deeper--to look into the scientific mind rather than simply to observe actions."[19]

What further sorts of data are sought? And how does one go about it?

The ways of getting the data are: (1) interviews, (2) diaries, (3) case studies, (4) questionnaires, as well as studies of reader failure (which exemplifies management by exception). My colleague at this meeting, J. L. Schofield, will speak to this.[20] An excellent run-down and summary of these four methodologies and numerous illustrations of their use in the physical and biological scientific literature is set forth in A. Stephanie Barver's paper, "A Critical Review of the Surveys of Scientists' Use of Libraries."[21]

Questionnaires are one interesting form of developing such information. Slater in her survey mentions:

> "User needs: An exploration of the needs underlying demands, and the extent to which demands reflect needs and/or other external factors. An attempt to investigate the relationship of demands and needs was made by collecting a very brief case history of each demand. Respondents were asked how specific demands arose from, and fitted into the pattern of their current work..."[22]

We need information on the non-user of the library. If we confine our study to the people who happen to be in the library, we are seriously missing the mark.

One of the comments to Hanson's study is of some interest for it turns on the suspicious character of the term "satisfaction"--not that we should throw it out, but only that we treat it rather cautiously--for a Mr. B. Evans, Ministry of Public Buildings and Works, mentioned that the Ministry "had a large number of small libraries--good and bad--and when he asked the users if they were satisfied with the library service, the users of the worst libraries expressed the greatest satisfaction with the service they got. One could regard the market research so far as establishing what was in existence, but the importance of the potential market was so much greater."[23]

Bernal had said that our job was not only to answer the questions asked but even more to answer the questions which had not been asked. This recalls a remark attributed to Archibald McLeish, when as Librarian of Congress, he is reported to have said: "Here we have all the answers--we just don't know all the questions."

The survey or questionnaire can either be a fact-finding survey of user behavior or user-reaction to the library system. It is generally much better to have the questionnaire ask the respondents for facts rather than for opinions.

What are some of the information gathering aspects in the various questionnaires (California, Purdue, Washington, etc.)?

1. Time spent in the library
2. Degree of use of library
3. Preference to buy books (California)
4. Purpose of use and degree of use
5. Quantity of material (satisfaction)
6. Quality of material
7. Adequacy of various library "products" indexing, interlibrary loan, catalog, etc.

One interesting feature of the Berkeley study was:

> "You are asked to weigh the costs and benefits which result from those decisions and then to select the decisions you yourself would make..."
>
> (a) With $100,000 in added funds
> (b) With no added funds

Behavior is studied in the Slater and Fisher survey from these perspectives:

1. What types of information are sought?
2. What purpose does the search serve?
3. What search methods are used?[24]

Other aspects of behavior that were brought out included:

1. The form of demand on the library. What was sought?
2. Origin of the demand: How it arose from user interests.
3. Effort made by user: frequency of library use, time taken in search, previous and future attempts to find the information sought.

The factors affecting this behavior are brought out as follows:

1. The nature of the institution
2. Communications structure within that institution including the existence of library service.
3. Searcher's work activity, i. e., job
4. Subject and rank
5. By the stage his job has reached
6. Time pressure under which he works
7. Subject discipline

The nature of the employing institution and work activity are more potent influences than subject discipline in Vickery's opinion.[25]

One question recurs in various studies: Can we indeed generalize? Is the user unique, and does this cancel out general findings or seriously impair their usefulness? Probably a large ingredient in bringing these two poles of thought nearer together concerns the matter of standards and standard times.

Is this the conflict between the systems analyst and the library profession--the former looking for the common denominator, the latter insisting on uniqueness? Is it science or art?

One point to mention clearly is brought out, also by B. C. Brookes.[26] This relates to the measurement of the rate of obsolescence in a journal file. Brookes brings the point that "only by sampling the actual usage of the literature in the local library context" can we get accurate results. Further, "The conclusion is that any librarian concerned with the rate of obsolescence of any of the scientific periodicals on his shelves cannot rely on measures derived from other sources even by correcting them. He must make his own measurements of the local usage directly." In other words, the uniqueness is asserted. Slater answered this point in her survey:

> "A core aim of the main study was further testing of a hypothesis strongly supported by trends emerging from the pilot. The hypothesis is: that it is possible to classify library users into distinct groups possessing characteristic relevant behavior patterns, and that it is possible to satisfy group demands and needs."[27]

Market analysis is importnat. It requires study by librarians but perhaps on a task force or team basis where the librarian is complemented by persons from other areas of knowledge, e. g., management. In our market analysis we also have to aim in directions which are usable or tractable when we deal with the question of the library's output or resources at hand.

III. OUTPUT

Output is intimately related to the foregoing discussion on Market Analysis. They merge. This is especially true when we talk about objectives (as part of Output) because objectives, conceptually at any rate, ought to derive from a combination of market analysis and from the present library resources.

Objectives present certain problems in definition for any organization. The library is no exception. There are important consequential factors present by varying the objective of a particular library; if we define a library's function in terms of printed materials, we get one set of sub-objectives; if we define library purpose as centered around the entire field of information, we derive another set of sub-objectives. (As with an industrial firm: if GM's objective is the production of automobiles or if it is transportation, we have the variation again).

The objectives are to be measured, in a market analysis fashion, with related information gathering and dispensing entities on the campus. There is an ever-present need to question objectives critically.

The discussion of objectives doesn't mean that one has to set up "crystal clear objectives." There is a need for a proper balance between clarity and obscurity. The proper focusing of attention on some goals--the clarity and obscurity. The proper focusing of attention on some goals--the use of the term "focus" is deliberate--this means a vagueness for the other parts of the picture not focussed on. As Gross puts it, "We must be very clear about many things we aim to do today and tomorrow. It might be dangerously misleading to seek similar clarity for our long-range goals." He continues:

> "Above all, vagueness is an essential part of all agreements resulting from compromise. When a dispute is resolved, some degree of ambiguity enters into the terms of settlement. Hence the wide-open language often used in the final language of statutory law." [28]

In looking at our ultimate objectives in the academic library, which we need to do from time to time to "defend" our sub-objectives, we have to examine other information activities.[29] This can result in our stretching, perhaps, legitimately or it can serve to fix a boundary a bit more clearly. This brings out the mutability of our objective; negatively, our overarching objective, defined even with obscurity, is not finished and left. Objectives ought to be re-examined.

The overall objective for GM could be the manufacture of automobiles or the production of the means of transportation. Failure to inspect objectives can result in being boxed into the environment, thought patterns, and context of the past.

What is the objective of laboratory analysis: accuracy--or to help doctors make a better diagnosis? Drucker puts it this way: What is our business? What should it be? What will it have to be? (The last of these speaks to the idea of the changeability of the overall objective.) [30]

Should some of the library's output be dropped, or de-emphasized? Should other output be intensified or should new services be added?

How much are the benefits of library services worth? What is the cost and how much are the costs and benefits of library services worth? What groups (income, social, age, etc.) benefit most and what groups bear the costs of providing library services? Can the objectives of public library service be all-inclusive as to "insure that every person should have a level of library service that meets his needs" without a careful consideration of benefits in relation to costs? Is it possible that the provision of "free" library services to some users may not be either efficient or equitable? Are there other cheaper ways to perform some of the services now supplied by the public libraries? For example, what are the best ways to purvey popular fiction to adult readers?

This seems to be on the right track; however, the elements seem to be:

1. Philosophical or conceptual ideas of what a public library ought to be, imparted by tradition, a philosophy nurtured by many years of funds, an entrenched system.
2. Demands of the constituency, which are of short duration but cumulative. What actually happens?
3. The "captivity" enforced by last year's budget is a powerful thing. To alter it is relatively easy, but it is terribly difficult to alter it substantially.

We raise questions, too, when we discuss output, of how much we are going to examine the larger system (say, the university) and whether we are going to take into account the other informational channels, such as document gathering by departments, the existence of departmental "reading rooms," or quasi libraries. On the last subject we might ask how to live with them and how to ease the functioning of the formal library system. The Audiovisual loan center, or the audiovisual materials center, if separate from the library, the computer center, and the bookstore, have a complementary function, that is they are in a sense "sister" educational functions.

We can question the inferences we may draw from our statistics. Is circulation an unalloyed blessing? Shorter loan periods can produce bigger and better ones! Turnstile counts, or more people in the library, is sometimes considered to be a more perfect meeting of library objectives. But as Schofield mentioned in one of his presentations, the numbers rose in one library, but this, on inspection, wasn't an occasion for joy; the people were coming back because they had failed to find what they wanted on an earlier visit.

The circumstances giving rise to the philosophical ideas are radically different. What is new: movies, phono records, radios, TV, paperback books, alternative educational opportunities (community colleges, "high cultural tradition" which Lacy mentions).

"The Library profession needs to reconsider objectives in light of changed conditions of today, to consider what objectives the library might better achieve than alternative institutions or alternative means, to recognize that library services require resources or money, to recognize the limitations on funds available for libraries, to establish priorities among their various services, and to begin to think about benefits and costs of library services, including the incidence of both." [31]

The use of the library's "production" has not suffered from lack of attention. A. K. Jain estimates that the "total number of published and unpublished studies concerning the use of books, journals, and library facilities is well over 700."[32]

The output of the library relates to what is being produced, how this production can be measured, and what the value of the production is.

This production ought to be related to what is known about the actual and potential users of the library system. A good part of the setting down of the objectives of the output ought to derive from the analysis of the examination of the "market."

In conjunction with market analysis, as discussed, the relationship of library output to other information gathering needs to be investigated; among the other sources are the bookstore, the instructional resource center, and the computer center. Perhaps in some sense we can say, too, that the library produces time or at least what it does produce is importantly time-centered: production is affected by the time a library is open for services.

To discuss output of a library seems to present a problem. What are libraries supposed to produce? The University of Durham's surveyors in their report, "Project for Evaluating the Benefits from University Libraries" put it this way:

> "First, nobody will say what precisely libraries are supposed to be doing. Second, the heterogeneity of the bookstock and the variety of the services make any sort of quantitative approach difficult. The two problems are connected: one cannot say one wants more unless one says more of what."[33]

Heterogeneity is important. An academic library may present a vast array of services. Actually it might be helpful to think of a university library as a collection of special libraries. It may be useful in our studies in quantifications to keep this in mind, and that we are in actuality dealing not with a single library but with a set of special libraries: different, if at times over-lapping constituencies, with their special techniques for inquiry. This has two important and related meanings I think: First, any theories we develop have to be recognized as limited; and second, that although we may lean on general findings, the influence of the local environment is tremendously important in making library management decisions.

The University of Durham's project spells out eleven "activities" to indicate what a library produces. These are:

Classification of the activities of the Library.

These can be divided into two types:

Final: Book circulation, reference questions answered, photocopies; also increasing the book stock is considered final.

Intermediate: Those not of direct benefit to users.

There are eleven activities mentioned.

1. Increasing book stock
2. Obtaining ILLs(interlibrary loans)
3. Supplying ILLs
4. Using library materials "in-house"
5. Circulation on long term
6. Reserve
7. Work place (i. e., not using library materials)
8. Photocopying
9. Service of special equipment
10. Reference, directional
11. Reference, substantial

Resources are enumerated as follows:

1. Labor
2. Bookstock
3. Equipment (seats, machines, empty shelves)
4. Uncommitted budget

The interesting part about this report is that it organizes the activities and the resources into a matrix, with each row representing a resource and each column representing an activity. Each number used then shows how many units of that resource (the row) are necessary to produce one unit of each activity. (Conceptually this can be viewed as a transformation of resources into activities.)

The analogy between the commercial firm and the public library is set forth in *Economic Aspects of Library Service* in Indiana (Pfister and Milliman) 1970, where they observe that "No market prices exist to guide the library in making decisions concerning what and how much to produce." They continue by remarking that it is "The public decides how much to use the library (how much library services to consume) at a zero price as libraries do not charge for most of their services." The library budget is determined by the political process, which thus determines the magnitude of its operation.

One of the principal wares produced by the library is space, a special kind of space, ideally combining quiet, comfort, and relatively attractive surroundings. This has been brought out in a number of studies. Slater mentions, "The highest single demand was for peace, quiet, and work space. This was mentioned by 38 percent of users."[34]

In Clements' survey 27 percent of all users wanted a "quiet place and a desk." [35] Joffe in a recent and well-conceived study of Technion, the Insustrial and Management Engineering Library of Haifa, indicated that the use of the reading room for the sutdy of one's own notes constitutes 14 percent of the use of the Library.[36] In the MIT survey the figure is 20 percent, in the Washington University user characteristics study it was 35 percent.[37, 38]

The library has to decide what "mix" of services to supply. This is an interesting problem. Maximizing profits would be the factor in determining the mix in a commercial enterprise. How does the library do it? Roland McKean indicated that "in organizations not subject to market discipline, decisions are the result of a bargaining process among different interest groups with different and perhaps conflicting objectives."[39] Pfister and Milliman continue by remarking that "We suspect that the library director makes most decisions with very little bargaining except perhaps through consultation with professional librarians on his staff. Thus, they conclude that the goals of public libraries as perceived by library directors and the library profession are the primary determinants of the decision rules concerning what and how much to produce.

What a library is supposed to be doing can be handled in anumber of ways. It is supposed to be doing what the diverse needs of a particular university campus point to. What it can do is limited by the inherited structure of heritage of past practice. The University of Durham surveyors point this out, too, in saying that "Most organizations and universities in particular, are severely limited in their actions by decisions taken in the past. A university library has a building, a book-stock, and a team of skilled workers. None of these resources can be changed significantly on a month-to-month basis."[40]

The Durham study then goes on from this point: They take resources as "given," then proceed to see how to maximize the benefits from these resources. Usually needs are taken as given and efforts are made to find the needs. This doesn't preclude taking the needs as given; in other words, one can do both concurrently.

The question of the nature and extent of the "mix" is covered to some extent in Littleton's "The Distribution and Cost of Library Service" in which he asks, "What proportions of personnel expenditures and staff are allocated to cataloging, acquisitions, circulation, reference, departmental libraries, special collections ?"[41] However, the study is more descriptive than it is normative. As stated, "The study reported here has been an exploratory attempt to understand the distribution of library service and its cost."[42] It analyzes sixteen university libraries and brings out averages, etc. But this is a fundamental question, namely, why is the mix as it is?

What do we need here? To answer this we first need to know what we are paying for, the different areas of service and then to decide on priorities.

In discussing the mix of library production it is relevant to mention, with respect to the various library production, the cost of its not having the information. An attempt should be made in discussing budgets to ascertain this cost. (The cost of not having a particular book in the library may be weighed against the cost of having it in a storage library)

In a university library the production is geared to a large variety of users--students, faculty, administration, and to some extent the community, in addition of course to interlibrary loans(exports). One of the areas of great concern has been that of circulation, both in the sense of a system, and also with respect to the study of the use of books.

One very interesting point in Urquhart and Schofield's investgation of reader failure at the shelf relates to a dramatically small number of books which are relevant to a failure. They say:

> "To put it in more dramatic terms 500 books out of 500,000 in open access accounted for half the readers recorded failure. They were not necessarily the same 500 books each time..."[43]

Trueswell computed that in the Deering Library of Social Science and Humanities at Northwestern University, 99 percent of current circulation sample of books had circulated at least once in the past 20 years. This is 40 percent of the current holdings. In other words, 1 percent of the current circulation related to books that had not circulated once in the past 20 years, and this would be 60 percent of the current holdings. This conclusion is mentioned because it also dramatizes a relatively small area where use is concentrated.

Does a very small portion of the library's holdings account for a large fraction of the daily circulation?[44]

A study of the Washington University loan circulation on a given day (faculty had indefinite loans) indicated that a very small portion of the users are responsible for the large number of books out on loan.

For example, 1 percent of the borrowers had 20 percent of the books on circulation on a given day; 30 percent of the borrower had 85 percent of the books. This can be shown on a "Lorenz curve." (Figure 1.) The "curve of absolute equality" would mean theoretically that 1 percent of the circulation is accounted for by 1 percent of the users, 5 percent of the circulation by 5 percent of the users, etc.

If we can combine both of these findings, a very small portion of the library's total holdings accounts for a large fraction of the daily circulation; secondly, a small group of the users is responsible for the daily circulation total.

IV. CONCLUSIONS

1. Library research units of various university libraries ought to meet periodically on an informal basis, primarily to avoid duplicative work and seek to achieve some loose coordination, exchange of ideas, and a more fruitful deployment of limited expertise.

2. The development of definitions and standard times is essential; otherwise a serious guessing game is being played, comparisons are made treacherous by the nature of their hidden differences. I thought the comment of B. C. Brookes on this point particularly probing:

> "In all areas of library science, it is not better theories what are first needed, but a more sophisticated approach to library management through a more disciplined measurement of library processes. As in all other sciences, theoretical development in library science will advance hand in hand with the practical improvement of measuring techniques--in this case of library usage--which alone can provide the data for suggesting, testing, validating, and developing theories which have practical applications."[45]

3. Without being too specific, we need additional surveys of the market to learn more about the people served and about the potential market on the periphery.

4. The present role of the library in the information transfer situation on the campus needs investigation. How does the library's function or role relate or compare with other functions which may be outside the library's present administrative jurisdiction?

This could be examined from these standpoints: (a) Are there functions which the library now performs that can be done better somewhere else? (b) Are there new things which we should be doing?

Even if there is no dropping or adding roles, some defining could be beneficial; if there is overlapping, it can be spotted and if desired, changed. Perhaps of more importance, if something is not being done, then the gap might be filled.

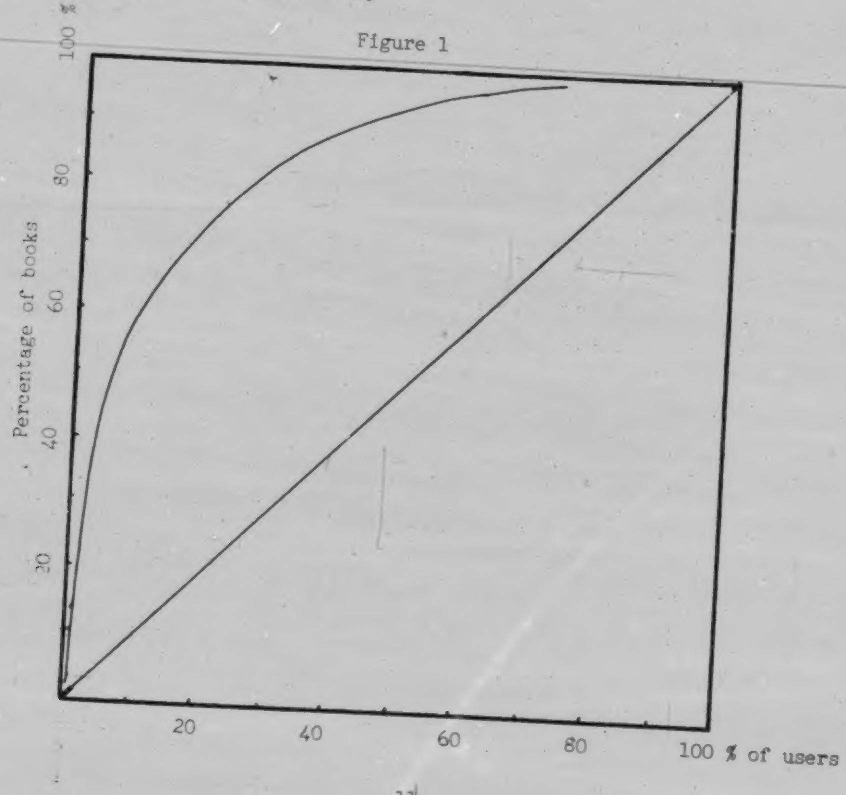

Figure 1

FOOTNOTES

1. It is interesting to note that virtually all of the panelists or speakers at the Graduate Library School Conference were operations research people--the outsider looking in, so to speak. Here we are virtually all librarians looking at ourselves from inside. The point can be made that we need both kinds of perspective, and a union of the two at times, especially as we examine and seek to solve specific library problems.

2. Munn, Robert F., "The Bottomless Pit, or the Academic Library as Viewed From the Administrative Building," *College and Research Libraries*, 29: 51-4, January, 1968.

3. Pfister, Richard L. and Jerome W. Milliman, *Economic Aspects of Library Service in Indiana. Report Number 7 of the Indiana Library Studies*. Bloomington, Indiana, 1970. p. 144.

4. Seiler, Karl, *Introduction to Systems Cost-Effectiveness*. Wiley, 1969. p. 1.

5. Grosse, Robert N., *An Introduction to Cost-Effectiveness Analysis*. Research Analysis Corporation, McLean, Va., July, 1965. p. 3.

6. In his letter of transmittal for the monumental *Public Libraries in the United States of America; Their History, Condition, and Management*. Cited in G. Flint Purdy, "Professional Overview," IN Palmer, David, *Planning for a Nationwide System of Library Statistics*. A.L.A. Library Administration Division, 1971.

7. Littleton, I. T., "The Distribution and Cost of Library Service," *College and Research Libraries*, November, 1956. p. 475.

8. Bourne, Charles and Madeleine Kasson, *Preliminary Report on the Review and Development of Standard Cost Data for Selected Library Technical Processing Functions*. Prepared for Council on Library Resources, Washington, D.C., 1969. p. 1.

9. Dougherty, Richard M., "Cost Analysis Studies in Libraries: Is There a Basis for Comparison?" *Library Resources and Technical Service*, 13:115-41, Winter, 1969.

10. Churchman, C. West, "Operations Research Prospects for Libraries," *Library Quarterly*, January, 1972, Vol. 42, No. 1. p. 10, 14.

11. Slater, Margaret and Pamela Fisher, *Use Made of Technical Libraries*. *Aslib Occasional Publication*, No. 2, 1969. p. v.

12. Hanson, C. W., "Research on Users' Needs: Where Is It Getting Us?" *Aslib Proceedings*, Vol. 16, No. 2, February, 1964. p. 73.

13. National Research Council. Council on Biological Sciences Information. *Information Handling in the Life Sciences*. Washington, D.C., 1970. p. 54.

14. *Ibid.*

15. Raffel, J. A. and R. Shishko, *Systematic Analysis of University Libraries: An Application of Cost-Benefit Analysis to the M.I.T. Libraries*. Cambridge, Mass., M.I.T. Press, 1969.

16. Slater, *Op. Cit.*

17. Hanson, *Op. Cit.*

18. Barber, A. Stephanie, "A Critical Review of the Surveys of Scientists' Use of Libraries." IN Saunders, W. L., ed., *The Provision and Use of Library and Documentation Services*. London, Pergamon, 1966. p. 146.

19. Hanson, *Op. Cit.*, p. 65.

20. Management by exception is a form of management control whereby only those atypical or "problem" cases come to management's attention is to be noted in a number of library management studies. Under this form of control the day-to-day transactions which conform to normal handling procedures are not referred to management study; only those which create some sort of problem. Thus, we can note that the studies relating to "failure" of one sort or another exemplify management by exception. It is a good way to study behavioral aspects because one can seek to understand or investigate the motivation and paths followed in the "failure," in the attempt to redress it or to understand it. Studies can be "library operations," "user behavior," "inter-library comparisons," etc.

21. Barber, *op. cit.*

22. Slater, *Op. Cit.*

23. Hanson, *Op. Cit.*, p. 76.

24. Slater, *Op. Cit.*, p. v.

25. Slater, *Op. Cit.*, p. v.

26. Brookes, C. B., "The Growth, Utility and Obsolescence of Scientific Periodical Literature," *Journal of Documentation,* Vol. 26, No. 4, Dec., 1970.

27. Slater, *Op. Cit.*, p. 1.

28. Gross, Bertram M., "What are your Organizations Objectives?" *Human Relations,* XVIII, August, 1965.

29. Painter, Anne F., "The Role of the Library in Relation to Other Information Activities," Indiana University, Bloomington, Indiana. Graduate Library School, August, 1968, NTIS, AD-682 010.
(...shows the trend away from library functions to newer forms...)

30. Drucker, Peter, *Managing for Results,* New York: Harper, 1964. p. 199.

31. Pfister & Milliman, *Op. Cit.*, p. 48.

32. Jain, A. K., "Sampling and Data Collection Methods for a Book-Use Study," *Library Quarterly,* July, 1969.

33. Durham University, *Project for Evaluating the Benefits from University Libraries.* p. 21.

34. Slater, Table 18, p. 28 gives the details:

Specific need for information and documents	54%
Translations and photocopies of known documents	2%
Keeping up to date and browsing	24%
Work space; peace, quiet, warmth (6,300 users)	38%

35. Clements, D. W. G., "Use Made of Public Reference Libraries: A Survey of Personal Users...& Postal Inquiries," *Journal of Documentation,* Vol. 23, No. 2, June, 1967.

36. Joffe, Ruth, "Determining the Effectiveness of the Use Made of Industrial and Management Engineering Library." Table 5.

37. Raffel and Shishko, *Op. Cit.*

38. Alexander, Carlos and Fischer, Kenneth, "User Characteristic Study of Washington University Library.

39. McKean, Roland N., "The Unseen Hand in Government," *American Economic Review,* Vol. LV, No. 3, June, 1965, pp. 496-505.

40. Durham University, *Op. Cit.*, p. 3. 1.

41. Littleton, I. T., "The Distribution and Cost of Library Service," *College and Research Libraries,* November, 1956. p. 474.

42. *Ibid.* p. 482.

43. Urquhart and Schofield, "Measuring Reader Failure at the Shelf," *Journal of Documentation,* p. 278.

44. Trueswell, Richard W., "Two Characteristics of Circulation and Their Effect on the Implementation of Mechanized Circulation Control Systems," *College & Research Libraries,* 25:285-91, July, 1964.

45. Brookes, B. C., "The Growth, Utility, and Obsolescence of Scientific Periodical Literature," *Journal of Documentation,* Vol. 26, No. 4, December, 1970. p. 293.

NATIONAL IMPLICATIONS OF FEDERAL LIBRARY STATISTICS*

Frank L. Schick **

The term "statistics" was first applied to the collection, study and interpretation of data of importance to national goverenments, such as the size of population, the number of births or deaths, actual revenue from taxation, the value of foreign and domestic trade, etc. The term is now exclusively related to numerical data, and the methods of collecting and interpreting them in order to arrive at some conclusions and projections. Statistics, like words, stand for things. According to the Encyclopedia Americana, they are numerical observations of almost any kind. They are really a quantitative shorthand which, when related to libraries, can indicate with considerable precision the resources, the staff, the budgets, the performance of a given library, or comparable data of all libraries in a given country or countries, provided that the same terms and same means of counting are used.

Historical Developments

The idea of using statistics for library purposes is over a century old. It was originated, however, not with librarians but with statisticians. Library statistics were discussed at the First International Statistical Congress in 1853 as a means to assess and compare intellectual library resources around the world. Until the 1930's librarians in the majority of developed countries did not have the knowledge or experience with statistics, nor the need to call on experts to devise statistical methods to solve their problems.

By the middle of this century, most of developed countries collected and published some library statistics. In the United States, prior to 1870, library statistics were collected by private sources and government agencies, such as the Census Bureas and the Smithsonian Institution. The first official and continuing series of library statistics originated in the report of the U. S. Commissioner of Education to the Secretary of the Interior for the year 1870, which contained a rather complete directory table of one hundred and sixty-one libraries. Library statistics have remained a responsibility of the Office of Education, formerly a part of the Department of Interior, now an agency of the Department of Health, Education and Welfare. From the 1930's to 1965, library statistics had been a responsibility of the Library Services Branch, the organization now known as the Bureau of Libraries and Educational Technology.

In 1966, the responsibility for all educational surveys was moved from the various parts of the Office into the National Center for Educational Statistics (NCES). Library statistics have been in this Bureau since that time.

The National Center for Educational Statistics is engaged in providing some fifty-five educational statistical series for administrators and educational decision makers on all levels of government.

The NCES Statistics Program

Between 1960 and 1972 the Office of Education and the National Center for Educational Statistics published a number of statistical library reports: 16 for college and university libraries; 7 for public libraries; 3 for schools; 3 for special libraries; 3 for library education; and 1 in the general field.

The current schedule up to this point calls for college and university library surveys every two years; public library surveys every three years; school library and media center surveys every four years. Special library and library education surveys at irregular intervals.

In 1966 the decision was made by NCES to discontinue separate overlapping surveys and to combine all the surveys relating to higher education into one general information system, known as HEGIS (Higher Education General Information Survey). The school surveys were combined into ELSEGIS (Elementary and Secondary Education General Information Survey). Instead of sending out surveys throughout the year, asking in each survey in part for identical or related data, all surveys are now combined in one unit and sent to one person, as far as possible in each state who acts as the state coordinator and became responsible for his state's coverage and response. Since 1966 library statistics have been a part of HEGIS and since 1970, a part of ELSEGIS.

The New Library Statistics Program

The primary goal of the Library Statistics Program is to collect basic library data at regular intervals and conduct special studies on such topics as physical facilities, manpower, sources of revenues and others to improve the question of libraries and to evaluate their performance.

During 1971, work on LIBGIS, the Library General Information Survey System, started. LIBGIS is based on the concept of close cooperation of the Office of Education with Library and other state agencies. Presently a common library data form is being developed which will be sent to all state agencies. They, in turn, will be invited to mail these forms to public, school, academic and special libraries in their state. This is a rather complex operation because in each state somewhat different arrangements have to be made. During 1973 experimental LIBGIS forms will be sent to coordinators in about half a dozen states, who will distribute our forms, collect them, do some pre-editing, and forward the complete forms to NCES. It is hoped that eventually the forms will be eliminated and be replaced by an exchange of tapes. The Library Surveys Branch is in the process of developing two parts of the LIBGIS form. The first part will contain the common core data which will be identical for all types of libraries. The second part will cover the essential data elements which are unique for each type of library--the college and university, school, public and special libraries. With adequate responses to these forms, uniform information for data items such as user population, resources, expenditures, and total staff will be available. To make the systems operational, the following steps have been developed:

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* Based on comments made during the Conference.

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1. Development of a National Plan.
   "Planning for a Nationwide System of Library Statistics" with David C. Palmer, Project Director, was published in May 1970 by OE/NCES.

2. Establishment of a National Inventory of Library Statistics Practices.
   A contract for the National Inventory was awarded to Herner & Company and will be released in 2 volumes during 1972-73. This study will supply a library statistics profile on the national level and in fifty states, and will be used to design the relevant LIBGIS data forms.

3. Conducting of a System Demonstration Project.
   The LIBGIS demonstration project was initiated in 1972. Six states have been selected to participate (Maine, Maryland, Mississippi, Texas, Wisconsin, and Wyoming) representing 2300 academic, public, school and special libraries in these states. At the completion, a report will be issued in 1973.

4. Development of Core and Library Type Data Forms.
   The common core and unique type library data were developed by the LSB staff, assisted by outside consultants.

5. Discussion of the LIBGIS project and assessment of national response.
   A LIBGIS evaluation project will be conducted during 1972-73 for one day; there will be background and evaluation sessions with representatives of the educational and library communities. During these sessions the LIBGIS forms will be reviewed and pretested.

6. Updating of the Library Statistics Handbook of the American Library Association and its accommodation to the LIBGIS operation.
   The revised handbook is to include a section of terminology in the field of non-print media, to provide an update of the 1966 library statistics handbook containing a section of state and national library data operations and to provide instructions for administering surveys and specifications for editing of forms with illustrative details. This work should be completed by the middle of 1974.

To get this system fully developed it will require the coordination of over 50 state agencies (most states have several relevant agencies which are responsible for elementary, secondary and higher education, and their libraries, public libraries and other related activities).

In addition to these efforts, close liaison is maintained with the nine statistics committees of the American and the Special Library Associations, and other organizations and associations.

Until LIBGIS is in full operation, the ongoing surveys will be completed and new ones will be incorporated into the library data system.

Standardization of Statistics

Some prefer standards to be entirely qualitative but past experiences convinced me that library standards should be both qualitative and quantitative. For purposes of comparison many data items must be quantifiable, a characteristic which is essential to assess and evaluate progress or retrogression over a period of time. Standards are used for comparisons and descriptions on the local, state and international levels. We now have library statistics standards on the international and national levels.[1]

For about 60 years, various attempts have been made to establish a standardized statistical terminology for libraries. Thanks to a Council on Library Resources funded project which produced the Library Statistics Handbook (published by ALA in 1966). The United States now has a recognized and useable library statistics terminology and this has been incorporated into the two international library statistics standards. In addition, this terminology has been incorporated in the USA Standard for Libraries published by the American National Standards

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[1] UNESCO "Recommendation Concerning the Standardization of Library Statistics. Paris, UNESCO, 1970.

Institute in 1969. (ANSI/Z39.7-1968).

As a result of seven years (1964-1971) of cooperation between IFLA[2] and ISO[3] with UNESCO, this work was brought to a successful conclusion.

One uses these statistics not only to satisfy the desire for exact information needed for budgetary and legislative purposes, but to check one's position in relation to others, because there has always been a competition between libraries within a state, a region, a nation or in the world for status with regard to the size of collection, the quality of staff or the quality of service, etc. Unified terminology and standardized quantification (how to count what one reports) have contributed to our ability to present information than was previously possible. Statistics have also been used to cover up facts because the most adequate definitions and fair quantifications provide no guarantee for preventing inaccurate reporting. Methodologies are now being developed to provide more exacting verification.

I agree with Professor Little's comment that quantitative standards frequently does not correct undesirable situations, but this problem is usually due to outdated standards rather than quantification itself. The American Standards Association requires that their standards be reviewed every five years. This is an essential process because it assures continuous inspection and provides for their best protection.

Standardization of terminology permits comparisons between similar organizations in terms of administrative effectiveness, and of justification. Libraries can evaluate their performance and indicate their financial situation effectively if they have the essential data relating to resources, staffing, expenditures, physical facilities, service population and the various types of activities (reference, interlibrary loan, cirulation). The current statistics programs are conducted by UNESCO internationally and by USOE/NCES for the United States essentially to achieve these objectives.

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[2] International Federation of Library Associations

[3] International Organization for Standardization

DEFINITIONS OF REQUIREMENTS FOR UNDERGRADUATE PROGRAMS IN UNIVERSITY LIBRARIES

Stanley McElderry

The purpose of this paper is to illustrate methods of quantification in two specific areas. One has to do with defining the collections that an undergraduate library should have, and the other with determining the amount of staff for public services. Methodology for quantification is being stressed rather than enumerating all of the components of an undergraduate library. The problem of an undergraduate library are not so different from those of the university library itself, and some of the data would apply to any level of academic library as well as a public library situation. However, we will not be discussing the undergraduate library in the sense of an undergraduate portion of a university library.

The need for quantifying is very obvious. In spite of all of the rhetoric that has been used in trying to describe what our needs are, ultimately a dollar value must be placed on it. Therefore, some way of quantifying needs is absolutely essential. Quantification also serves to help evaluate present practices and to determine which alternative courses of action might be appropriately chosen. This matter has been studied from an introspective view, as we usually talk about one library rather than several libraries of the same type or in the same region. We still are somewhat bound by the circumstances of one library at the present time, although an advanced technology will give us some flexibility in the future to deal with common needs of a number of libraries serving differing clientels.

The nature of the program tends to set some limits on the undergraduate library; whereas, the university library is more open ended.

In a sense the undergraduate library has its program objectives already laid out for it by a joint decision of faculty, administration, and board of trustees or regents. This dependence on program in an academic institution is in sharp contrast to public library which has to set some values itself. It has to decide what information needs of a community are and do it with less specific direction and guidelines that would be true of an academic institution.

COLLECTION

It would seem that defining of a collection is a simple process in an academic library, for the educational program objectives as given by the joint decision of faculty and administration will outline various subject parameters and determine the kinds of collection that would be appropriate for them. This is not simple! For one thing, it is necessary to get an agreement from various people on what the role of the library is. The library can be regarded as simply a way of supplementing the instructional program of the institution. That is, it supplies only the books that faculty members assign for students to read. Few are willing to subscribe to such a restricted view, for the library in practice usually offers an opportunity to extend the curriculum. It goes into areas where courses cannot be offered and where there is not enough interest or competent faculty to teach them. The library really is broader in range than the entire curriculum.

Another question that should be answered is "What is the real purpose of education?" "Is it a matter of emphasizing the subject content of the program or is it a method we are really teaching?" In other words, "Are we training people to solve problems in the world that they are facing or are we trying to get them to memorize information that the faculty regards as important?" Naturally there is no agreement, in most instances, the progressive faculty would say that it is really something of both or that method is more important than content. In any case, the collection must be able to support independent inquiry into a wide range of subjects by students. These questions make the collection problem much more complex than if we simply followed the subject parameters the curriculum imposes. Whatever comes out in terms of definition of what the library's role is, it has to be explicit and it has to be understood by the people that support the library. If library role is in terms of vague aspirations, although most people refer to the library as the heart of the institution, few will supply the blood to it.

What would seem to be the objective in defining a collection for an undergraduate institution would be a giant shopping list of all the books that it should have or all the materials that ought to be in the library. This approach has a number of flaws, the main one of which is that there is no agreement as to what the list should contain. There are so many books available that there is little hope of looking at all of them firsthand and deciding what ought to be in the collection. One must depend on the appraisal of a wide range of people. Secondly, the appraisal made at one point of time is not constant, for people change their minds. For example, today's definition of sociology will not be the same a year from now. Thirdly, if two persons make an assessment, their definition is not going to be the same. One faculty member may build up a collection in an institution, then, leave for Harvard. Someone who replaces him would want a whole new collection. One wonders if it would be better for the library to send the books along with the faculty member wherever he went!

Another seemingly obvious flaw in the shopping list approach is that bibliography in an academic discipline is really an evolving process. It is continually changing. It fits the description by an earlier speaker, Mr. Taylor, of a paradigm where the dimensions of the discipline are constantly changing. What strikes one in trying to define the literature at a point in time is that this process is really the heart of scholarly work--the search for literature relevent to its continued development. This changes continually.

There is, however, a structure in the literature which makes some difference between an undergraduate program and graduate program. The following is a simple view of this structure. There appear to be three general levels. Starting with the middle level, which is referred to as the observational level, it is a working area of a scholarly discipline in terms of the direct observation that people make of things that they can feel, touch, and smell, etc. in their own environment. It is voluminous in size, because it represents numerous individual contributions of various scholars in journal articles and monographs. This is where the great productivity in scholarship is.

Another group of people tend to work at another level--an upper level of abstraction. These are people who are writing monographs and treatises that deal with the observational literature in a conceptual sense. In other words, they are trying to interpret and make some sense out of it and indicate what is significant in the observational area.

The base level might be referred to as the synthesis level. This is the kind of thing the faculty member does when lecturing to a class or writing a textbook. He is simply telling the state of the art of a discipline at a point of time, summarizing everything known about a discipline as it exists today and pointing out some of the main theories and concepts. He cites selective contributions made to the discipline.

The base and middle levels are particularly appropriate in an undergraduate program, and this is what one would hope would be the content of the undergraduate collection. The people on the base level (synthesis level) use the same literature that an undergraduate student does, but in smaller quantity. They are drawing selectively from the level of observation and abstraction. They take in just a part of the classics, the landmarks, the current interpretations of the discipline for their summary.

In trying to define the resources for undergraduates, one may use various checklists, which in a sense represent consensus of the members of a discipline at a point in time, provided these are systematically developed by a process as one would have in something like a jury system. One may put together a book like *Books for College Libraries* and say these are the books that any respectable undergraduate library ought to have. One may develop a list like *Choice* to cover current acquisition, and say these *Choice* recommended books are the ones that ought to be in the collection. This is a common practice. It leads to a certain kind of standardization of holdings. We don not know whether this practice represents the belief that there tends to be a consensus or whether it is simply expedient to buy materials that are listed in one of these checklists.

The best one can hope for in defining a collection is not a complete title listing of everything that ought to be in the collection, but an agreement on how big the collection ought to be and how fast it will grow. This is done in a political context. We try to do this through professional associations by developing standards which say a respectable library should have at least 50,000 volumes or should have five percent of the general educational budget of a college or university. These are simple ways of trying to express a general prescription.

What this paper would like to discuss with this section and the one that follows is simply to present in a somewhat evolutionary fashion the methods that have been used to deal with the problems of defining what the collection should be in a quantitative way, that is, how big the basic collection should be and how fast it should grow.

The first method to determine these is one that has been and still is in use to a great extent. It is simply enumerating what the collection should contain in terms of the types or subjects of material. The materials are defined in terms of the functional uses--what application might be made of materials that would be acquired. The following quotation from the 1959 *Standards for College Libraries* illustrate this point. The standards say:

> "The library collection of books, periodicals, pamphlets, documents, newspapers, maps, microfilms, microcards, microprints, and other materials must be so constituted and organized as to give effective strength and support to the educational program of the institution. In addition to the materials relating directly or indirectly to the curriculum, the collection should contain the

> the standard works which represent the heritage of civilization. These works should be continuously supplemented by a wide variety of books which combine timeliness with enduring value, chosen to arouse the intellectual curiosity of students and satisfy their educational reading needs."

This would, no doubt, buoy up the spirits of an acquisitions librarian: but it is very hard to translate it into the specific titles that the library ought to have. Such is the type of rhetoric typically used in standards. It has limited value in defining the collection.

Another good example of a description of a college library collection is an article by McKeon called, "The Nature of the College Library Book Collection." This was one of the papers in the Graduate Library School Institute held at the University of Chicago in 1954. The article followed the same pattern of trying to identify by type and by use materials that ought to be in a college library collection. This is not going to help librarians very much, because they somehow still have to get answers to "How many books does this mean?" and "How many dollars does it cost?" The college library standards do give some suggestions on how to make this conversion. The standards estimated the size and growth rate both in terms of a minimum collection of 50,000 volumes and in terms of five percent of the general educational budget as an overall gross level of support.

Tables 1 and 2 demonstrate actual examples of how one has developed from the point of enumerating requirements to the point of trying to get down to actual numbers. The first example is one that was developed by American Library Association in 1947, in Classification and Pay Plans for Libraries in Institutions of Higher Education. Recognition has been given to the level of the student population: lower division, upper division, honors student, graduate student and faculty. This was a way of computing what was referred to then as the service load. It was determined by taking the total enrollment in each of the five different categories of users and multiply it by the given weight. It is simply a weighted enrollment index to quantification.

To determine how many books the library should have, the full service load was segmented so that progressively reduced number of volumes was applied to the successive segment of gross size--50 volumes for each unit of service load for the 800 units, 25 volumes for the next segment of 700, 15 volumes for the next segment of 1500, and only 5 volumes per unit in excess of 3,000. This assumed that the relationship between enrollment and the number of books was not a fixed one and that the collection slowly stabilized beyond a certain size. The same applied to a university library that had somewhat heavier weightings. There are many libraries that still use one variation of this approach.

The method of quantification shown in Table 3 starts with the same weighted enrollment base, but it is expressed in dollars. This is one currently in use for the publicly supported institutions in Texas, where the colleges and universities all derive their gross budget on the basis of a dollar amount determined for each level of student. For example, the weighting for a master's level student versus that for an undergraduate is at about two to one ratio. The weighting jumps significantly over four times for a doctoral level student. It starts with the weighted enrollment index. It is expressed in student credit hours (SCH), which is the amount of enrollment times the number of units that the course gives. For example, a three unit course, enrolling ten students, will make a total of thirty student credit hours. These credit hours are multiplied by the rate expressed in dollars. The total library budget including the book budget can be derived by this method. In Texas the whole structure of the budget is this way--each academic discipline has its own set of numbers. Texas adopted this formula in the mid-sixties, and there has been only about a 10 percent adjustment in that interval of time. As everyone knows, prices have virtually doubled on everything during the same time period while only a 4 percent increase was assumed. The projection, however, gives some idea of what the library budget might be in 1980. It is always a mistake to express a formula in dollar amount.

In other jurisdictions, they will often express it in number of volumes, hoping that one can use the current book price to convert it into dollars. This was done in California: Tables 4 and 5 illustrate what one can do with U.S.O.E. statistics. In California state college system, it is a fairly common practice to compare institutions--one selects colleges and universities that have similar programs so that one can demonstrate how one's library holdings and growth rate compare with others, hoping that one's unfavorable position will give some leverage in getting more support. Table 4 illustrates such comparison of institutions representing the range of programs and the size of enrollment. Data of this kind must be converted to some common denominator that gives some way of comparing one university to another. The device used was to convert holdings into per capita holdings. The middle column shows per student holdings, and this is used as the main index of adequacy.

In applying this one must look at a

Table 1. American Library Association Classification and Pay Plan for Libraries in Institutions of Higher Learning--1947

The service load of a library is determined as follows:

Each Lower Division student (equivalent full-time) 1 x ______ = units
Each Upper Division Student (EFT) . . . . 2 x
Each honors student (EFT) . . . . 3 x
Each graduate student (EFT) . . . . 4 x
Each faculty member (EFT) . . . . 5 x
The service load for my library is . . . ______ units

Table 2. American Library Association Classification and Pay Plan for Libraries in Institutions of Higher Learning--1947

Collection Formula

Quantitative appraisal of book collection (excluding unused duplicates). What is the suggested number of volumes for your service load? (Fill in one)

a. For a college library.
(1) 50 vols. for each unit of first 800 units . . . . vols.
(2) 25 vols. for each unit of next 700 units . . . . vols.
(3) 15 vols. for each unit of next 1500 units . . . . vols.
(4) 5 vols. for each unit in excess of 3000 units . . . . vols.
Total . . . . vols.

b. For a university library.
(1) 100 vols. for each unit of first 2000 units . . . . vols.
(2) 50 vols. for each unit of next 2000 units . . . . vols.
(3) 30 vols. for each unit of next 2000 units . . . . vols.
(4) 10 vols. for each unit in excess of 6000 units . . . . vols.
Total . . . . vols.

c. Actual total in this library . . . . vols.

Table 3. Projection of Coordinating Board Formula Rate: 1973/74 - 1980/81*

	Rate ($) Per Student Credit Hour			
Year	Undergraduate	Master's	Doctoral	Law
1973/74	2.03	4.06	17.36	10.71
1974/75	2.03	4.06	17.36	10.71
1975/76	2.11	4.22	18.05	11.14
1976/77	2.11	4.22	18.05	11.14
1977/78	2.19	4.39	18.77	11.59
1978/79	2.19	4.39	18.77	11.59
1979/80	2.28	4.57	19.52	12.05
1980/81	2.28	4.57	19.52	12.05

*From 1965/66 through 1970/71 the appropriated formula rate increased 10.7%. The projection is based on a 4% increase in the appropriated rate for 1971/73, as recommended by the Coordinating Board, and 4% biennial increase thereafter.

Table 4. Comparison of the Number of Volumes Held Per Student and Acquired Annually Per Student, 1962-1963.

Group	Number	Average Number Held/Student	Median Number Held/Student	Average Number Added/Student	Median Number Added/Student
Colleges & Univ. Above 3,500	197	60.61	41.40	3.35	2.52
Selected Colleges	16	123.44	96.27	5.46	3.17
California State Colleges	16	28.25	18.96	6.48	2.36

Table 5. Per Capita Library Holdings in Selected U.S. Colleges and Universities

Institution	State	Enrollment	% of Graduate Student	Number of Volumes	Number of Volumes Per Capita
Wesleyan University	Conn.	1,146	B	503,414	439.26
Dartmouth College	N.H.	3,404	C	866,255	254.48
Oberlin College	Ohio	2,430	B	575,189	236.70
Brandeis University	Mass.	1,751	C	298,012	170.20
Carleton College	Minn.	1,317		192,551	146.20
Pomona College	Calif.	2,568	C	348,385	135.66
Occidental College	Calif.	1,530	B	175,181	114.50
Univ. of Rochester	N.Y.	7,233	C	781,496	108.05
Washington State Univ.	Wash.	8,310	B	800,000	96.27
Rutgers University	N.J.	21,541	C	1,078,916	50.09
Bowling Green Univ.	Ohio	8,401	B	385,654	45.90
Oregon State Univ.	Oregon	10,026	C	434,753	43.36
Univ. of Colorado	Colo.	19,557	C	839,540	42.93
Colorado State Univ.	Colo.	7,304	B	233,792	32.01
Wayne State Univ.	Mich.	20,865	D	833,750	39.96
Brooklyn College	N.Y.	22,355	B	434,264	19.43
AVERAGE					123.44

Source: U.S. Office of Education. *Library Statistics of Colleges and Universities, 1962-63; Institutional Data.* Washington, U.S. Government Printing Office, 1964. OE-15023-63.

broader sample of institutions represented in the U.S.O.E. data. California people used institutions with more than 3,500 enrollments, because this was the minimum size anticipated for state colleges in California. There were 197 such institutions and their average book holdings per student was 60.6[illegible], and the median was 41.40, and so forth. These larger sample institutions were, then, compared to the selected sample institutions to show that the latter samples had better averages and medians than the overall average of the OE sample institutions. The selected institutions had an average of 123 books per student, but the California colleges had only about 28.25 books per student. The general interpretation to these figures was that since the California colleges were growing faster than comparable institutions, their book collection was really very inadequate; therefore, they had to have a larger growth rate.

While California institutions were struggling with the legislative analysts and other fiscal officers, Messrs. Clapp and Jordan were working on the same problem in Ohio, and they developed the famous Clapp-Jordan formula which gives recognition to a number of factors that were not common in others. The formula identified level of student as well as programs at various levels. In other words, given a level, the weight is given in terms of number of books; in the same way a uniform weight is given to each of many undergraduate major subject fields, and to each of master's subject fields and to each of doctoral subject fields, and so forth. Given the level, the same weight is applied whether it is physical education or history. The weight is simply an average for a level of student or an academic program.

Table 6 shows the application of the Clapp-Jordan formula in North Carolina to determine what the minimum or threshold level of collection ought to be. Table 7 demonstrates how the colleges and universities in the state of Washington applied the Clapp-Jordan formula with modified weightings. Washington people used a larger base collection arguing that if 50,000 volumes were the appropriate minimum size in 1959, and in the meantime, publishing had increased for the following six years at such and such a rate, surely the base collection ought to be increased by 1968. According to this argument, it was estimated that the base collection ought to be 85,000 volumes. Table 7 indicates the modified base collection and application of more or less the same weighting by level of student and program to compute gross size. These were the formula used for budgetary support of state supported institutions and the report containing these shows how the formula was applied to various institutions.

California had a more difficult problem. From its earlier data they had computed a ten-year goal of 40 books per student, which seemed like a reasonable goal. The U.S. Office of Education data showed that the California institutions were substantially short of that goal. To reach that goal, it would take a book budget about three times the budget of that time for the following ten years. One of the virtues of comparison approach and the use of statistics is that local pride may play in one's favor.

From the U.S.O.E. data if one stripped those institutions that, for example, had technical programs only, one would obtain 906 colleges and universities. If these institutions were then grouped according to the identification given in the OE statistics by base of support, one could develop a number of correlations. For example, one could find out whether enrollment was related to the number of books that the library would hold.

Table 8 shows these correlations in various types of institutions between enrollment and book holdings. The R is major correlation coefficient and R^2 is a more sophisticated indication of predicted variance. Correlation between collection size and enrollment is very low among private liberal arts colleges; whereas, public universities and liberal arts colleges indicate a better correlation. The latter group was the group of institution which most closely related to the California State Colleges. A more detailed analysis was made with that group in trying to defend a level of support. Other studies tend to show little relationship between enrollment and size of collection particularly at the university level. For example, a study by Dunn and others at Purdue showing projected growth of fifty eight major university libraries indicates very little correlation between enrollment and size of collection. As it worked out, however, California librarians found that among public universities and liberal arts colleges as a whole there was a positive correlation between enrollment and collection size.

This California data were then compared with the OE data which showed just the typical size colleges and universities. The top line in Table 9 shows the number of students projected from 1959-1963 and the number of volumes per student. Volumes held per student decreased womewhat, while the number of volumes added per student increased slightly over the year.

The foregoing data may not be convincing, so a more sophisticated analysis maybe attempted. Table 10 shows multiple regression equations which are developed to determine the number of volumes that would be required. The equation shows simply a measure of the median position of all the institutions analyzed which, in this case, numbered about 200. If one plots just enrollment against size of collection, one would produce a chart showing a somewhat

Table 6. University of North Carolina Application of Clapp-Jordan Formula

(1)	50,750	Vols.	--basic collection
(2)	115,500	"	--100 volumes x 1,155 FTE faculty.[a]
(3)	176,916	"	--12 volumes x 14,743 FTE students.[b]
(4)	23,400	"	--12 volumes x 1,950 undergraduate honors students.[c]
(5)	19,765	"	--335 volumes x 59 undergraduate "major subject" fields.[d]
(6)	283,650	"	--3,050 volumes x 93 master's fields.[e]
(7)	1,494,[illegible]00	"	--24,500 volumes x 61 doctoral fields.[f]
	2,185,831	"	--required for "minimum" adequacy.
	1,455,839	"	--as of June 30, 1967
	729,992	"	--short of "minimum" adequacy.

[a] North Carolina Board of Higher Education. *Statistical Abstract of Higher Education in North Carolina,* 1967-68, Table XXXVI, pg. 65.

[b] *Ibid.*, Table V, pg. 11.

[c] Board of Higher Education Library Questionnaire for fiscal year ending June 30, 1968. p. 2.

[d] North Carolina Board of Higher Education. *Higher Education in North Carolina.* Vol. III, No. 9, April 25, 1968. pgs. 2-11

[e] *Ibid.*, pgs. 12-15.

[f] *Ibid.*

Table 7. Publicly Supported Colleges and Universities in Washington Book Formula

1.	Basic or opening day collection	85,000 units library resources
2.	Allowance per F.T.E. faculty	100 units library resources
3.	Allowance per F.T.E. student	15 units library resources
4.	Allowance per masters field when no doctorate offered in field	6,100 units library resources
5.	Allowance per masters field when doctorate is offered in field	3,050 units library resources
6.	Allowance per doctoral field	24,500 units library resources

That a minimum number of acquisitions per year be established equal to five percent of the estimated number of units of library resources held at the start of each fiscal year.

That anticipated deletions from the collection be based on the percentage ratio of deletions to total holdings experienced in the most recent actual year up to a maximum of three percent per year.

Table 8. Correlation Between Number of Volumes Held by Libraries and Undergraduate and Graduate Enrollments by Type of Institution, 1962-1963.

Type of Institution	Number	R	R^2
Public Liberal Arts	102	.69	.47
Public Universities	97	.84	.70
Public University & Liberal Arts	199	.83	.68
Public & Private Liberal Arts	796	.41	.17
Private Universities	64	.55	.30
Private Liberal Arts	644	.43	.18
Private Universities & Liberal Arts	708	.65	.43
Public & Private Universities	161	.61	.39
All Institutions	906	.71	.51

R = Multiple correlation coefficient

R^2 = Coefficient of determination

Table 9. California State Colleges Formula Revision Study

Comparison of the mean number of students, volumes held, volumes acquired and current periodicals by public liberal arts colleges and universities, 1959-63.

Mean Number of:	1959	1960	1961	1962	1963
Students	6,959	7,515	7,673	8,343	9,345
Volumes held per student	50.5	47.0	48.5	46.0	44.5
Volumes added per student	2.56	2.58	2.86	2.84	2.80
Current periodicals per student	0.45	0.42	0.43	0.42	0.40

Table 10. Regression Equations for Library Development 1965-1966 Data

$Y_v = 25245 + 127\ x_1 + 30.202\ x_2$ $\quad R^2$ .616

where Y_v = Volumes required, x_1 = Graduate FTE, x_2 = Undergraduate FTE

$Y_{va} = 7310 + 1.39\ x_1 + 0.656\ x_2 + .040\ x_3$

where Y_{va} = Volumes added, x_1 = Graduate FTE, x_2 = Undergraduate FTE

x_3 = Volumes in library

$Y_p = 268 + (-.1600)\ x_1 + (-.1637)\ x_2 + .01037\ x_3 + .06709\ x_4$

where Y_p = Periodical titles x_4 = Volumes to add convex curve of the median level--as the number of students increases, the volume size goes up sharply first and then the rate slows down. Multiple regression equations provide a means of considering a number of factors simultaneously. The constant in front of x_1 and that of x_2 indicate the weight given to the graduate and to the undergraduate enrollments, respectively. This is a way to determine what the size of the base collection would be and what the growth rate of the collection should be. It is simply a way of showing what the median situation would look like for the country as a whole for one group of libraries.

This approach was refined later in a paper by Reichard and Orsagh[1] from Lehigh University which demonstrated a way of taking a multiple regression equation and adding a factor which would adjust it to the percentile level desired for comparison. In other words, if one prefered being compared at the 90th percentile of institutions, one could work out this equation and find what size of collection and growth rate existed at the 90th percentile. So, the equation could be made adjustable rather than constant at the median.

The following are examples of other approaches which indicate a direction that might make more sense in the future. Table 11 is simply a truncated table; the whole table appeared in an article in *College and Research Libraries*,[2] which shows the collection of the University of Florida. This is one of the first efforts to try to get down to a subject modular level rather than dealing with gross size. The base used in this approach was the printed Library of Congress catalog and its supplements. Using that base, percentage of holdings of the University of Florida was derived subject by subject so that one can see how many volumes the university had in various subject areas.

North Carolina used the same approach comparing their holdings with Duke University. As it happened, the total holdings of the two institutions were virtually the same. However, North Carolina claimed that their collection should be larger since they were putting heavy emphasis on humanities and social sciences, whereas Duke was heavily oriented to physical sciences. Thus North Carolina could demonstrate that they were actually short by x number of volumes because their programs were in areas that were more dependent on library resources. Some might question the validity of this approach in deriving percentages of holdings in relation to some standard collection, such as Library of Congress Catalogs. Anyway, this is an interesting approach to use, and North Carolina used it with good results.

About two years ago, this writer received a request from the University of Texas administration to estimate the size of the base collections for three new universities proposed for the University of Texas System. These universities were to be located at Dallas, Midland-Odessa, and San Antonio. The question was how big the collection should be. The universities were not concerned with rate of growth at the time, although that problem was still to be faced. They wanted to know the size of the needed budget for the collection. To refine techniques a bit further to give a more convincing case, the following approach was used. As shown in Table 12, the proposed degree programs for the three campuses were converted to conform with the standard Office of Education terminology. The use of categories of degree programs that were standardized by the Office of Education would be extremely helpful with book publishing data. The projected bachelor's, master's, and doctoral programs for each of the three new campuses were indicated in the table. The next step is to find out where the overlaps are in terms of collection.

The problem here is to find out what kind of collection will be needed to support the three degree programs proposed for the new campuses. One way to do this is using a standard base list, ***Books for College Library***. In order to give some credibility to that base list, the undergraduate library collection at the University of Texas Austin campus was examined to see how the various subject titles were distributed percentage-wise in the BCL list and in the undergraduate library collection in Austin. These two are compared subject by subject in terms of number of titles and percentage that represents the subject group in Table 13. Just looking at degree programs and nothing else, it required 84 percent of the BCL list to give library support to the degree programs proposed at the new campuses. In other words, it encompassed everything but 15 percent of the list. although one might argue that they needed some of this as well because the library was not completely limited to the curriculum.

One may wonder how these data could be converted to show a projection into the future. Table 14 shows the use of subject categories that were defined by the Office of Education and Richard Abel's approval plan data for 1969 which indicate the number of books published by subjects. In Table 14, the levels 3-4 are the college level. Level 5 is research. The U.S. and non-U.S. publications were tabulated separately as well as jointly. One can put together all kinds of combinations according to one's degree programs and emphasis. One can conceivably come out with the same or similar projection for one set of four-year institutions

Table 11. University of Florida Percentage Comparison of Subject Holdings With Library of Congress Book Catalogs

Library Allocation Designation	Percent LC Book Catalogs to Dec. 1947	Percent LC Author Catalog & NUC 1948-57	Percent All LC Catalogs to 1957	Percent Univ. of Florida Holdings
Agriculture	5.762	4.463	5.367	6.867
Anthropology	.823	.959	.864	.710
Architecture	1.194	1.180	1.190	2.655
Art	2.485	2.950	2.626	1.245
Psychology	1.210	1.327	1.246	1.386
Religion	5.940	5.864	5.917	2.328
Sociology	3.341	4.241	3.615	3.312
Speech	.419	.147	.336	.266
Total	99.987	99.985	99.988	99.984
Number Sampled	6,195	2,711	8,906	......

Source: College and Research Libraries, July 1966.

Table 12. Comparison of Degree Programs Proposed for New University of Texas Campuses

Degree Program	Institution at								
	Dallas			Midland-Odessa			San Antonio		
Biological Sciences									
Biology, General	B[a]	..	..	B	..	..	B	..	..
Biology, Molecular	..	M[a]	D[a]	..	..	..	..	..	..
Business & Commerce									
Business Administration	B	..	..	B	..	..	B	..	..
Education									
Elementary	B	..	..	B	..	..	B	..	..
Secondary	B	..	..	B	..	..	B	..	..
Engineering	..	..	..	B	..	..	..	..	..
English	B	..	..	B	..	..	B	..	..
Journalism	..	..	..	..	..	..	..	..	..
Fine Arts	B	..	..	..	..	..	B	..	..
Applied Arts									
Art	B	..	..	..	..	..	B	..	..
Music	B	..	..	..	..	..	B	..	..
Speech &	..	..	..	..	..	..	..	..	..
Drama	B	..	..	..	..	..	B	..	..
Foreign Languages and Literature	B	..	..	B	..	..	B	..	..
Mathematics	B	M	D	B	..	..	B	..	..
Physical Sciences									
Chemistry	B	M	D	B	..	..	B	..	..
Geology	B	..	..	B	..	..	..	..	..
Geosciences	..	M	D	..	..	..	..	..	..
Physics	B	M	D	B	..	..	B	..	..
Psychology	B	..	..	B	..	..	B	..	..
Social Sciences (Basic)									
Anthropology	..	..	..	B	..	..	..	..	..
Economics	B	..	..	B	..	..	B	..	..
Government	B	..	..	B	..	..	B	..	..
History	B	..	..	B	..	..	B	..	..
Sociology	B	..	..	..	..	..	B	..	..
Social Sciences (Applied)									
Mexican-American Studies	..	..	..	..	..	..	B	..	..

[a] B for Bachelor M for Master D for Doctoral program.

Table 13. Subject Analysis of Titles in ***Books for College Libraries*** and in the Undergraduate Library of the University of Texas at Austin.

Subject	*Books for College Libraries*		Undergraduate Library	
	No. of Titles	Percent	No. of Titles	Percent
Related to degree programs[a]				
Biological Sciences				
Biology, general	386	0.7	766	0.9
Botany, General	129	0.3	281	0.3
Microbiology	..	..	47	0.1
Zoology, General	346	0.7	750	0.9
Business and Commerce	770	1.5	2,492	2.9
Education	1,177	2.4	1,125	1.3
Engineering	465	0.9	438	0.5
English Language & Literature	10,590	21.1	17,323	20.0
Fine and Applied Arts				
Art	933	1.9	2,016	2.3
Music	1,442	2.9	1,313	1.5
Speech & Dramatic Arts	657	1.3	1,751	2.0
Foreign Language & Literature				
French	1,563	3.1	2,281	2.7
German	662	1.3	1,539	1.8
Spanish	517	1.0	867	1.0
Geography	342	0.7	3,719[b]	4.3
Home Economics	66	0.1	150	0.2
Mathematical Subjects	642	1.3	938	1.1
Computer Science	..	..	..	..
Mathematics	..	..	..	..
Philosophy	1,724	3.5	3,188	3.7
Physical Sciences				
Chemistry	348	0.7	250	0.3
Geology	221	0.4	344	0.4
Physics	528	1.1	469	0.5
Psychology	840	1.7	313	0.4
Social Sciences (Basic)	186	0.4	..	..
Anthropology	309	0.6	500	0.6
Economics	2,860	5.7	3,414	4.0
Government	1,843	3.7	3,016	3.5
History				
General	928	1.9	375	0.4
American	3,819	7.7	4,750	5.5
Other	5,146	10.3	6,125	7.1
Sociology	1,641	3.3	3,391	3.9
Other				
Bibliography[c]	1,086	2.2	734	0.9
Biography[c]	..	..	10,523	12.2
Subtotal	42,166	84.6	75,188	87.2
Not related to degree program				
All other	7,673	15.4	11,052	12.8
TOTAL	48,839	100.0	86,240	100.0

[a] "Degree related" in this table means all subjects in which courses are offered.

[b] Includes description and travel, which is included in History in ***Books for College Libraries.***

[c] A literary form, but also a contribution to the literature of the subjects listed above.

Table 14. Number of Monographic Titles in English Published in 1969[a]

Subject	U.S.		Non-U.S.		Total	Per Cent
	Levels 3-4[b]	Level 5[b]	Levels 3-4[b]	Level 5[b]		
Related to new campus degree programs[c]						
1. Biological Sciences	684	142	254	77	1,157	5.9
2. Business & Commerce	484	571	339	382	1,776	9.0
3. Education	332	262	117	109	820	4.2
4. Engineering	275	96	214	61	646	3.3
5. English Language & Literature (Included in 10)	..	..	..	..	..	..
6. Fine & Applied Arts	61	813	38	356	1,268	6.5
a. Arts	..	..	..	..	..	..
b. Music	..	..	..	..	..	..
c. Speech & Dramatic Arts	..	..	..	..	..	..
7. Foreign Language & Literature (Included in 10)	..	..	..	..	..	..
8. Geography	21	25	20	17	83	0.4
9. Home Economics	9	83	10	41	143	0.7
10. Language & Literature	475	1,499	225	577	2,776	14.1
a. English Language & Literature	..	..	..	..	..	..
b. Foreign Languages	..	..	..	..	..	..
11. Mathematical Subjects	451	31	95	24	601	3.0
12. Philosophy	114	158	28	60	360	1.8
13. Physical Sciences	814	121	343	58	1,336	6.8
a. Chemistry	..	..	..	..	..	..
b. Geology	..	..	..	..	..	..
c. Geosciences	..	..	..	..	..	..
d. Physics	..	..	..	..	..	..
14. Psychology	250	137	56	43	486	2.5
15. Social Sciences (Basic)						
a. Anthropology	49	74	23	32	178	0.9
b. Economics (Included in 2)	..	..	..	..	..	..
c. Government	165	420	368	134	1,087	5.5
d. History, American	57	738	21	61	877	4.5
Other	154	793	98	511	1,556	7.9
16. Sociology	172	448	89	157	866	4.4
17. Other						
Bibliography	96	103	61	54	314	1.6
Subtotal	4,663	6,514	2,399	2,754	16,330	83.0
Non-related to degree programs						
All Others	1,172	1,335	355	471	3,333	17.0
TOTAL	5,835	7,849	2,754	3,225	19,663	100.00

---

[a] Source: Richard Abel and Company's price study of books issued through their approval program in 1969.

[b] Levels 3-4 are college level, 5 research level.

[c] "Degree related" in this table means all subjects in which courses are offered.

that have only the bachelor's degree programs. According to the table, one is going to have to add 4,600 titles a year to maintain that program. If one includes some graduate level materials, then one is going to more than double the amount of buying that should take place. If one is going into foreign publications, then one is going to add even more, which means that a working collection level is somewhere between a low of 5,835 for the total and more than 19,000. If one is restricted only to the subjects represented in the degree program, the range would be from 4,600 to 16,000. This is only for one year. Richard Abel does have comparable data which are expanding more and more. The non-U.S. category is a loose one which keeps growing in size. Given the unit cost data and the publishing data with the average price for a given year, one can get a dollar amount or a projected cost.

The method just discussed represents the most refined approach in that one would have a way to introduce an element of predictability of probable use and future requirement, provided one knows the current production rate of books by subject fields that is meaningful. If one knows not only the active literature of a discipline that covers, say, twenty year, but also the production rate per year, one can project the future base collection requirement. One could refine this approach further so that the projection in the future could be precise as to the number of titles needed with somewhat firmer supporting data. The more specific and detailed one's scales are in terms of program, the more credence one can lend to the projection or estimate.

The serials collection represents a confusing element in this process. It is a very sizeable element in proportion to the total holdings in an academic library, although somewhat less of a factor in undergraduate collection. No satisfactory way to deal with serial collection requirements has been developed that is comparable to the subject modular approach in defining monographic requirements.

STAFF

The second half of this discussion is to look at the problems of defining public service requirement in an undergraduate library. Assuming that we know what the educational program is and what demand the instructional methods will make on the library, the problem is how to determine the number of staff members needed. This problem could be handled in the same way as the collection has been handled. One would quickly begin enumerating the services that are going to be performed, namely, circulation, reserve, serials, and so forth, and we would structure this into service points. For instance, the circulation department would determine that the library hours are 79 hours a week; therefore, the department needs at least one person at that point at all times. Thus one could set up a service point at a physical location and make a policy determination on the amount of staffing that is going to be given to that point. Then one would try to find ways to bolster and defend the argument and the policy. One would keep record of the number of books circulated and count how many people come in the library and/or how many questions are asked at any time of the day or the week. Thus one could determine all of these work load type of data and try to relate them to the organizational structure. These are the arguments that one could advance to fiscal officers in defence of one's budget. Table 15 illustrates these arguments.

The first example starts out again with the classification and pay plan for libraries. In the beginning of this discussion, Table 1 indicated the service load formula which was, in fact, a weighted enrollment formula. Here it is applied to the number of staff positions. (Table 15) This is not just public service staff but the total library staff. It does not indicate except in a general prescription what the proportion of professional and non-professional staff should be. This total service load of the library is converted into numbers of people.

Table 16 shows University of Washington data for public services. It used again a weighting by level of student, just as the old ALA plan did but with somewhat different weights. It takes the full-time equivalent enrollment and converts that into total number of people to determine what the staffing ought to be. In California, however, more difficulty was encountered with this. The U.S.O.E. data were used again. With these data, however, it was not possible to break down the staffing into technical and public services. California data in Tables 17 and 18 show how the staff were divided into technical and public services; assuming a distribution of half and half for all the sample colleges and universities. The number of volumes added was divided by the number of staff positions in technical services to obtain an average of 948 volumes per position in the national sample. Likewise, the number of students served was divided by the number of public service staff to obtain an average of 432 students per position. This process was repeated for selective national samples and for California samples. (Table 18) Thus the staffing policy is geared to the growth rate of the collection and the number of students served. It does not really matter whether one counts enrollment or the books so long as one gets some meaningful numbers to indicate how large a staff the library should have. When one gets these numbers, one can compare oneself with these data on national samples or other comparable institutions to find out one's relative position.

Table 15. American Library Association Classification and Pay Plan for Libraries in Institutions of Higher Learning, 1947.

Determine the recommended number of staff positions according to the service load as follows:

(a) For a college library:
  (1) Chief librarian plus 3 professionals for first 800 units.
    (For less than 800 units, chief librarian plus 1 professional)
  (2) Add 1 professional for each 500 units or major fraction thereof.... Total prof.____
(b) For a university library:
  (1) Less than 2000 units, chief librarian plus 6 professionals.
  (2) 2000-3999 units, chief librarian plus 6 professionals for the first 2000 units plus 1 additional for each 500 units or major fraction thereof......... ____
  (3) 4000-5999 units, chief librarian plus 10 professional for the first 4000 units plus 1 additional for each 500 units or major fraction thereof....Total prof.____
(c) Actual number of professional positions......... .... ____

(d) Balance of professional and clerical positions.

NOTE: A proper balance between professional and clerical positions requires that not more than 60% or less than 40% of the staff be clerical. Count the student assistants as clerical and equate as F.T.E.

		No.	%
This library staff is divided as follows:	Professional	____	____
	Clerical	____	____
	Student	____	____

Table 16. Publicly Supported Colleges and Universities in Washington, Staffing Formula for Public Services

Public services (including a pro rata share of library administration)
Using the revised definition of F.T.E. students, weight

100/200	level F.T.E. students	at 1.00
300/400	level F.T.E. students	at 1.80
500	level F.T.E. students	at 4.30
600/700	level F.T.E. students	at 6.00
Registered outside users		at 1.00

Determine the total weighted enrollment and divide by a factor of 220 to derive F.T.E. Formula Public Service Staff.

Tables 17 and 18. California State Colleges Formula Study -- Comparison of Staffing in Academic Libraries By Level of Position, 1962-63, and Comparison of the Number of Volumes Added Per Position in Technical Service and the Number of Students Served Per Position in Public Service, 1962-63.

		All Colleges & Universities Above 3500	Selected Colleges & Universities	California State Colleges
Staffing by level of position				
% professional average		34.47	34.40	38.39
% non-professional average		41.01	44.87	35.96
% student average		24.53	22.73	25.35
No. of vols. added/tech. service position.	Average	948.55	866.56	973.71
	Median	792.65	758.97	632.87
No. of students served/ public service position	Average	432.07	230.19	256.77
	Median	328.72	186.13	288.11

If no one is convinced by these comparisons, a little more sophisticated approach may be called for. So, the U.S.O.E. data were run through the computer again and 200 colleges and universities were extracted out of 900. This process was necessary to make sure that these institutions, are comparable. This was an attempt to find correlations between the number of library staff and each of five factors: number of graduate students, number of undergraduate students, volumes added, volumes held, and periodicals received. The result is shown in Table 19, which indicates how well one can predict the total staff of an academic library if one knows the number of graduate students, undergraduate students, and so forth. The overall correlation coefficient of .94 is very high and enhances the validity of the factors analyzed. Such a correlation means that the combined influence of five factors is the square of .94 or 88.36 percent. If one knew the number of volumes added, one could predict the staff requirement with correlation of .93, which is the highest of all five factors. In other words, knowing this single factor of number of volumes added each year is almost as good as knowing all five factors.

Using the same five factors that were used in the previous correlation study, a multiple regression study was made and a series of regression equations were developed. Table 20 shows such equations which indicate how to compute the number of professional librarians the median institution had, and how to compute non-professional librarians, student assistant hours, and the total staff. Each of the four equations consists of six terms, the five of which involve the five factors previously enumerated. Each term has a weighting indicating the relative importance of each factor in determining staff size. Looking at the fourth equation, which is concerned with total staff, it appears that the number of periodical titles is as significant as the number of either graduate or undergraduate students.

As previously introduced, one may use the Reichard-Orsagh technique[1] if one wants to be compared at a certain percentile level.

In determining number of staff positions, one may use the so-called standard times approach. Tables 21 and 22 illustrate the formula and the weighted standard time data developed for the State University of New York. These apply to both technical and public services. It shows that New York people used basically enrollment data weighted--diferent weightings for different classes of institutions. By looking at the table, it is not clear how these classes were derived. In Table 21, reader services man-year requirement is expressed by a large C, which is an enrollment number, and a small c which is a constant or a weighted standard time in minutes. How the latter was derived is shown in Table 22, in which various units of work in public services were determined probably by the use of diary technique.

This is probably the most precise method one can use in determining the staff requirement. However, the problem is much more difficult when two or more institutions are involved. One may have a detailed knowledge of one's own staff to interpret a diary and assess the distribution of time. When one is trying to get the same kind of data from several institutions, one will have to use a flow chart or some similar device whereby the beginning and ending steps of each operation are defined. For example, if it is about a bibliographic search, one will have to indicate exactly what steps are taken to make sure that everyone is recording time in the same way. Another illustration of this difficulty is the fact that the so called ready reference service of five minutes or less of staff time can easily be extended to ten or twenty-minute service unless the staff time is rationed arbitrarily.

CONCLUDING OBSERVATIONS

We have discussed a number of approaches that have been actually used by institutions of higher education in various states. We have examined various facets of a crystal, but these do not exhaust all the possible approaches to determine the present and future requirements of undergraduate college libraries.

There are other dimensions, some of which are very significant. Some of the previous speakers have touched on qualitative factors. But, we all suffer from the Einstein Syndrome, that is, we think the library should operate in such a way that there will be one Einstein developed per generation and that anything we can do to facilitate this process would justify it. The qualitative element is evident in such a value question as "What can or should the college library be?" What we are able to measure by quantitative techniques depends on the questions that are asked.

We have developed very sophisticated statistical techniques to measure precisely what the college library collection or staff is today in terms of the median, average, or the 90th percentile. We can even calculate the probability of what it will be tomorrow or ten years from now and make a reasonable projection of future requirements. This is the thrust of all of our quantitative effort, but we should not be blinded by the sophistication we have developed. We can measure what the current situation is, but these methods do not answer the question of what it ought to be.

Table 19. California State Colleges Formula Study--Factors Associated With Size of Staff

Correlation of amount of staff with:

Graduate students	.84	Undergraduate students	.80
Number of volumes added	.93	Number of volumes held	.91
No. of periodicals received	.89		

Coefficient of multiple correlation five factors .94

Table 20. Regression Equations for Library Development, 1965-1966 Data

1. $Y_{pl} = -.8292 + .00028\ x_1 + .00026\ x_2 + .000025\ x_3 + .00021\ x_4 + .00033\ x_5$
2. $Y_{np} = -2.4190 + .00063\ x_1 + .00061\ x_2 + .000017\ x_3 + .0004\ x_4 + .0013\ x_5$
3. $Y_{sa} = +1211 \pm 1.4676\ x_1 + 1.4673\ x_2 + .0231\ x_3 + .3680\ x_4 + (-.1816)\ x_5$
4. $Y_s = -.2.64 + .00165\ x_1 + .00167\ x_2 + .00005\ x_3 + .0008\ x_4 + .00156\ x_5$

Y_{pl} = Professional librarians
Y_{np} = Non-professional librarian
Y_{sa} = Student assistant hours
Y_s = Total staff

x_1 = Graduate FTE (Full Time Equivalent)
x_2 = Undergraduate FTE
x_3 = Volumes in library
x_4 = Volumes to add
x_5 = Periodical titles

Table 21. State University of New York Library Manpower Study, 1968

1. Technical Services Man-Year Requirements: $(TS) = \dfrac{Aa + Bb}{96{,}000 \text{ min.}}$
2. Reader Services Man-Year Requirements: $(RS) = \dfrac{Cc + Dd + Ee}{96{,}000} + Y$
3. Administration Man-Year Requirements: $(Adm) = X\ (TS + RS)$
4. Total Library Man-Year Requirements = TS + RS + Adm

Where: (Weighted Standard Time in Minutes)

		Class I	Class II	Class III
A = Holdings and	a =	3.627	2.768	2.437
B = Acquisitions and	b =	120.348	138.831	142.258
C = FTE Users and	c =	157.295	120.308	165.167
D = Headcount Students and	d =	60.647	139.214	207.517
E = Faculty & Staff and	e =	96.250	148.156	174.174
X = % of TS & RS staff required for Adm.		20.81 %	14.22 %	10.0 %

Y = (.06 FTE x Number of Freshmen)/ 600 for Classes I, II, and III.

Number of minutes per man-year = 96,000 or 1600 hours/year x 60 min.

Table 22. State University of New York Library Manpower Study, 1968

Reader Services Standards - Based on FTE Users				
Guidance to reader	Referrals	6.116 x	1.0 =	6.116
Advice to reader	Referrals	1.437	2.3 =	3.305
Receipt of faculty reserve requests	Titles	.300	20.0 =	6.000
Assembly & reproduction of material	Items reprod.	.011	10.0 =	.110
Removal from reserve collection	Titles	.231	4.0 =	.924
Reference questions	Questions	6.790	20.0 =	135.800
Interlibrary borrowings	No. borrowed	.120	42.0 =	5.040
Total weighted time				157.295 min.
Reader Services Standards - Based on Head Count				
Charge-outs of materials	Volumes	6.993	2.0	13.986
Return of materials	Volumes received	9.154	4.2	38.446
Preparation of overdue notices	Overdues	1.141	7.2	8.215
Total weighted time				60.647 min.
Reader Services Standards - Based on Faculty & Staff				
Abstract prepared	Abstract	.050	15.0	.750
Bibliographies prepared	Bibliographies	.200	450.0	90.000
Interlibrary loans	Number loaned	.250	22.0	5.500
				96.250 min.
Reader Services Standards --- Based on Teaching Students				
.06 FTE librarians per 600 FTE freshmen				

Most management literature seems to suggest that one should try to extrapolate requirements from very explicitly defined objectives of the library's role. Reasonable agreement on the size and growth rate of the collection and staff should be derived from the definition of the library's role supported by comparative statistical data. Qualitative elements involved in these processes maybe assessed through operations research techniques evaluating various alternatives.

We have to recognize, however, that these processes are all being done in a political context. Very often we deal with management people who do not know or care what a library is. Often these people decide for us what the library will be. We try to present our case the best we can, and we can attempt to overpower these people with massive statistical data to support our case. But these people are operating in a political context--it is somewhat like the approach of a fiscal officer who knows at the very outset before he examines the budget how much money is available for the library. To give the library any more money, he must take it away from someone else. It is far easier to keep the budget right where it is if he can develop a rationale to do so. The game, therefore, is to try to prevent him from finding soft spots in the budget by presenting more sophisticate kinds of data and by anticipating opposing arguments. The librarian can describe and indicate what can be provided at a given dollar amount, but what the institution can afford or is willing to pay cannot be controlled. In spite of all the sophisticated techniques we have developed there is still a very large area for salesmanship. The more sophisticated the quantification is, the more leverage it may provide in influencing just wherethe blue pencil is going to be used.

FOOTNOTES

1. Reichard, Edioin W., and Thomas J. Orsagh. "Holdings and Expenditures of U.S. Academic Libraries; and Evaluative Technique." *College and Research Libraries* Vol. 27, No. 6 November, 1966. pp. 478-487.

2. Kebabian, Paul B. "The Distance to a Star: Subject Measurement of the Library of Congress and University of Florida Collections," *College and Research Libraries*, Vol. 27, pp. 267-270. July, 1966.

LIBRARY PERFORMANCE MEASUREMENT TECHNIQUES
DEVELOPED FOR UNIVERSITY LIBRARIES IN ENGLAND

James L. Schofield

I won't go into too much detail on the historical background of the establishment of the Library Management Research Unit except to say that we are mainly working in the area of academic libraries in England. During this session, I would like to talk about three of the projects we have been working on at the LMRU. We have, of course, undertaken other projects, but these three, I think, are most applicable to this seminar. As we see it, there are two main catchment areas of management information in any library; the readers and their activities and the library staff and the operations they perform.

The first system I would like to deal with is for gathering and handling information on staff operations. We call it "administrative effectiveness." Louis Round Wilson in an article, "The Next Fifty Years," stated: "Libraries do not have devices at present by which they can measure their administrative effectiveness or social significance. The next ten years will witness the development of a body of costs and measurements for various types of library services, which will meet adverse criticisms and enable the library to justify its support upon a basis of substantial facts rather than unproven assumptions. To a philosophy of action and specific objectives will be added measures of performances, all of which are essential to sustained progressive achievement." As you probably know, this was written in 1936.

The main problem is how to get information both simply and cheaply over a really representative period without causing murmurs of discontent among staff, or involving everybody in an amount of extra work which they can ill afford. The solution we offer is a self-recording study with simple forms and a principle of obtaining information by exceptional reporting. Let me first try to clear up any doubts about where I stand on the definitions of efficiency and effectiveness. In fact, I accept Drucker's definitions: efficiency-doing anything (right or wrong) in a less wasteful manner; effectiveness--doing the right thing to achieve your objects. But I do think that efficiency is a necessary condition of effectiveness.

What we intend our system to provide, is information for the Librarian on the performance of his staff in all or any one of their tasks and procedures. This information should help to assess the productivity and the cost in terms of time and thereby to assess their effectiveness in achieving the library's goals at the least cost, in the shortest time. A library staff can reach the zenith of efficiency while contributing little to the library's effectiveness. It can also be effective up to a point but play ducks and drakes with hours and pounds, (or dollars in this country). You can't say in a university library or for that matter in any library, "We're overpaying him, but he is worth it.' We are assuming that librarians have engraved upon their hearts the axiom: "the best service at the least possible time and cost,"--at all events, they want to make their funds go as far as they can. For them effectiveness will certainly imply efficiency, and efficiency tends toward effectiveness.

I think that our most fundamental principle in developing the system has been the need for current information on activities within a library system. I mean quantitative information at intervals shorter than a whole year. We feel that the managing librarian needs more frequent, and often more relevant, records of progress or delays in current work, of time lost, gained or diverted among his departments; he does not want to initiate a special investigation whenever some external body or internal crisis prompts him to seek this information. AT the same time, and this is our second principle, the most senior administrator should not be deluged by a flow of unsifted management information.

A two-tiered system was,therefore, envisaged. Records proceeding from the executive and clerical staff to their department heads, and summaries from them to the librarian or his deputy. This principle of management by exception was carried down to the very method of recording.

The third principle was the desirability of a self-recording technique in libraries, at least when a report on all of a library's subsystems was required. We hoped from the start that our system would be flexible; that is, capable of application to any type of department, group within a department, or individual, capable of recording any kind of task, lengthy or brief, repetitive or requiring careful thought. Which tasks it was to record would depend upon how the system was being used: for general management information, or for the special study of one procedure in great detail.

The responsibility of middle management (the department heads in our case) for keeping more senior librarians informed, was a further principle. Wilson and Tauber suggest that their responsibilities include: rating staff members on their efficiency by production records, periodic tests or rating devices, seeing that essential records and statistics are kept; and preparing reports for the senior librarians. The management information which we think they should collect will increase their own control of events within their departments, and at the same time give them some ammunition (or an emolient) for their upward reports. The system can improve communication, but only by careful control of the information being supplied. We have a simple faith in the recording of what most library staff call "statistics," which I shall call 'units of work,' in this context, provided always that these units represent something which has created work for, or is the result of work by, the staff.

Our final underlying principle has been the need for a system which can be run, and even installed, by the staff of any library which wants the information, either for a period or permanently. Naturally, we did not want staff spending too much time on recording, and the analysis we planned to make as straightforward as could be, given a slide rule and an adding machine at the extreme. You may be interested to compare our principles--and our practice--with the basic considerations and techniques discussed by Leslie Harmer in his booklet on *Clerical Work Management.* It is surprising how often in this useful introduction 'library' can be substituted for 'office' without the reader's feeling that his remarks then become irrelevant. I think that was a straightforward enough introduction to this particular paper.

For simplicity I will now outline the installation of this system of administrative effectiveness in a small library. We have done this in many libraries, large and small. This particular library had a staff of fifteen. The principle behind this information gathering exercise--with two simple pieces of paper (see Samples A and B) is: on A form, we asked people to record what we call their primary tasks. We interviewed the staff and asked, "What is your primary task?" or "Which is the most time-consuming task of your day's work?" A cataloger would say, "My principle task is cataloging, but I do many other things." So we ask them to ignore recording of cataloging, but record the other things they do. In order to time we don't ask them to use a stop watch; a recording of around three, four, or five minutes plus is sufficient. It is amazing the type of quantified information you get. In addition, we ask them to record compensatory time off. I don't think you have that over here, but in England for evening duties you have time off in lieu. This, of course, can be time completely lost to a department. If you have a cataloging department and people are doing evening duty, that is a complete loss of day work to that processing department. So you are rather living in a fool's paradise. You think that you have a staff of ten catalogers, but you may be losing two of them because of compensatory time off. In this way we start getting some idea of where time is going. Obviously, within libraries you get people that say, "Well, I don't really have any single primary task." We say, "All right, tell us what you do." They may say, "Oh, I do a bit of shelving, a little bit of cataloging, etc." We note these odd processes on the second form B, and we say, "Whenever you do any of these, give us some recordings and on sheet A record your compensatory time off--leave, sickness, absence, etc."

What do we get from this sort of thing? We are first of all able to produce an analysis sheet (See sample C) for an individual. At the top we get the total amount of time that person had available for their library work. Then we start subtracting from that any time for evening duties, sickness, absence, holidays, etc. This gives us a net available time for library operations. Then we get all these odd things that they do, in this case a cataloger. This one was tracing reserve books, counter, recording copies, checking invoices, checking orders, etc.,; quite a lot of miscellaneous tasks. At the same time we asked them where possible to give units of through-put or units of work. If she's checking invoices, whe'll say, "Oh yes, I spent two hours checking invoices, and I checked 136."

You will notice on some of the analysis sheets we don't have all units of work. This arose because our unitwas purely advisory and we did not like to insist upon this. But it is quite in order for the Librarian to say to his staff, "I must have these units of work." However, we did get a lot of data through the good will of the staff concerned, giving us a total amount of time devoted to the performance of tasks. Subtract one from the other and you get in this case twenty-one hours, forty-seven minutes and the total amount of cataloging which was one hundred and ninety-one items cataloged. It's very simple, very broad, very basic. The total time recorded as being available for cataloging include the time for personal needs, coffee breaks, etc. We previously subtracted the lunch hour periods from the total time available. From there we collate the individual's analysis sheets with others performing like duties.

The example of this is illustrated (See sample D) here in respect of subject specialists. This particular library employed three subject specialists. The three subject specialists you will see were able to provide the library with a possible one hundred and twelve hours, thirty minutes. This is in a one week period, but they had compensatory time off, counter duties, shelving, periodical work, etc., and an amount of miscellaneous tasks. Instead of having one hundred and twelve hours of time for subject specialization, they came out with fifty-one hours and twenty minutes, and even that includes this time for coffee breaks, etc. So you're rather living in a fool's paradise by saying, "Oh yes, I have two subject specialists." It averages out very evenly for every week of this particular survey.

The next stage is to produce a complete picture of the library. We divide the analysis sheet (See samples E, F and G) into readers' services and technical services (activities). Again starting from the total amount of time that was available to the library in this case, about five hundred hours, they lost forty hours due to compensatory time off, sickness, leave, etc. The reader service activities, subject specialization, counter, inter-library loans, etc. totaled one hundred and eighty-nine hours, forty minutes. That was the total amount of time put into the reader service activities. We follow that on by the amount of time put into the order process--forty-four hours; to accounts--eight hours; accessioning--twelve hours; cataloging and classification--one hundred and eleven hours; and these areas as you can see are even split by amount of time to cataloging and classification, cataloging only, classification only, etc. in each case giving amount of time plus the number of units. You can see we are coming up with a library average time for the performance of these particular tasks.

This particular library in the third and fourth weeks of the survey was coming up with thirty hours worth of staff time devoted to meetings. One person works thirty-seven hours a week. You're losing one person per week having various meetings. This survey quantifies where staff time goes throughout the library and provides an analysis of the various aspects of this time. Now let's go into questions.

Q: Was this information self-recorded by the staff?

A: Self-recorded. We found that staff rather like informing their superiors where their time goes. I think a lot of junior staff are under the impression that their seniors don't really appreciate what they are doing. In general I've found the staff have no strong dislike for this type of survey.

Q: Who decided on the duration of the survey?

A: We set the period and informed the staff we were going to do this survey for a month and each of those columns represented one week. In this particular library we did it for a month. Of the two columns; one is for hours and the other for units of through-put.

Q: Did you come out with a figure of the differential between the acceptable work week and the real work week for the individual staff member?

A: It's a question of what is acceptable.

Q: Your staff conventionally works a forty-hour week or five eight-hour days. What was the difference between that and the real work week allowing for illness, compensatory time off, etc.?

A: You usually find out there is a loss of up to 25 percent of time. This may be illustrated by a larger library. A survey over a twelve week period of the total amount of time that that library could work staff came to 40,000 hrs. With days off, sick leaves, meetings and so on, the time that was available for departmental working was reduced to 25,000 hrs. This is a very considerable amount of time, and I don't think library administrators have this sort of data when planning the staff structure. It is a heck of a lot of time (40,000 down to 25,000 hrs.) before you're really even starting to do any work.

Q: Who decided on what to record?

A: We let the staff decide what they were doing. It was surprising how simple it became.

Q: Do you find different times being recorded for the same task by different people?

A: Within the library you're getting your individual type of report. We have found within libraries the times for cataloging can vary drastically by types of materials. These times very easily appear. In one library some were being produced at about an average of fifteen minutes per item while one person in nine hours produced nine books. I was rather worried about this, but it was one hour per item, because I went in there and timed the procedure including the bibliographic checking, walking, etc. In fact the whole process was timed.

Q: Did you ever find it expedient to reclassify what people were doing? For example, when a cataloger was spending more time at something else not very desirable but more in the cataloging.

A: Well, this of course does happen, but it is not for me to install a change. I think it's the librarian himself, through the examination of this material to decide. Some librarians have said to me, "My goodness, I stopped that process two years ago." I think an analysis of this type of information is done better by the professional. This is what you're paid for. The professional is the better one to analyze. He can see much more into these sort of things than I can. All I do is produce the information using two simple pieces of paper.

Q: Do you have more difficulty identifying units of work, like answering a reference question or finding a book for somebody on the shelves?

A: If we were measuring and wanting an accurate measure of the extent of inquiries we say, direction inquiry of about ten minutes to thirty minutes. Over thirty minutes and we can get these divisions. In this library, talking about inquiries on floors you see two hundred and one hours and thirty minutes and the cost to the library is one hundred and thirty pounds and four pence for 1,660 inquiries. That statement is reasonably detailed and obtained very easily.

Q: Did you do this by invitation?

A: No, rather by selling ourselves, at least to start with.

Q: Who did the inquisition?

A: Well, we have to sell ourselves to the libraries. This was our first major task, really, to find the libraries in which to experiment. Now, of course, we are invited by librarians. With this in view, we developed packages and write the installation instructions and they go ahead by themselves. It's terribly simple.

Q: Has it been written up?

A: Yes.

Q: Could you give us the reference?

A: Yes, Journal of Librarianship, Volume No. 3, No. 4, October, 1971. Lots of people have queried the value of self recording and it's accuracy. In general, I found the librarians to be more honest than industrial employees in this respect. We have asked people to record specific tasks and then I have returned to the library and timed these tasks. The accuracy is measuring. We're now working on a paper; I think we're calling it, "An Abbreviated Approach to Work Measurement in Libraries." This is an attempt to establish a standard, a norm, or an average for the performance of a single task. We think now that a few self-recordings of any chosen single task will give you a very, very good norm, and of course give a norm and the amount of time taken you to get a measure of effectiveness.

Q: How did you come out on book selection?

A: Total time devoted to selection, and items selected. It's as broad as that. You have to select and just quantify what you can. Half a cake is better than none let's say.

Q: How does the staff prepare for this study?

A: I usually gather the staff together, talk to them and explain what I'm going to do. They're very happy as it's not a big-brother-watching-you type of thing.

Q: What sort of directions are explained to them?

A: I just talk to the staff and explain to them what I want them to do. It only takes, in a library of 160 or so staff, a day to get around, and have a quick chat with them. If I'm installing, I prefer to speak to each person individually and create a feeling of personal involvement.

Q: Now what's goint to happen to all this information?

A: A librarian can start replanning the structure of his staff. You know how much time they're taking at present for say cataloging process. I see that young lady was cataloging about 191 in twenty hours, if you have about a couple of hundred backlog you know it's going to take you about another twenty to clear it. In this particular library he was about to design a new staff structure for the new library and one of the areas he wanted to increase was subject specialization. He said, "I have three, I think I need another one." When he had the survey results he saw he had more than one really available, but they were losing so much time on other things. They were rather frustrated and they did not feel as if they were performing the task which they were employed to do. They were doing other things such as reshelving, counter duties, etc. So really looking at the whole picture he decided to take on a much more junior level of person by the reallocation of work and in actual fact that cost is effective. So there are many ways that one can do this and make decisions which is the main thing. The information is there and you can make decisions with this type of information.

Q: What about student help?

A: We don't use a lot of students help in our country. If you have student help, and they are manning your desk all the time the principle is the same. This is the simplicity of the thing.

Q: Are most of these positions civil service or are they private?

A: What within the libraries?

Q: Yes, I know they're run by the state.

A: No, they're university. They're employed by the university.

Q: There are public universities?

A: Yes, state universities.

Q: And therfore they are not public or state employed?

A: Well, we don't think that way. I suppose indirectly we are paid by the government, but we look upon ourselves, or themselves, as a member of a university although the money comes from the government.

Q: Tell me, what is your method of isolating the qualitative aspect in certain instances?

A: The thing is, the person drawing the conclusions is the librarian, and this is where the qualitative assessment ought to be left.

Q: What basis are you judging that?

A: What is he wanting? Quality of cataloging?

Q: No, I'm referring to the situation such as for instance the unit cost of the cataloging department for German publications is one thing. The unit cost for the same type of material from the Orient is another thing altogether.

A: If you're having this different sort of qualitative approach to it, you don't have to fit all your processes into one. So it is far-eastern, near east, etc. You can retain that assessment within certain areas.

The whole thing is so flexible you can divide on your grouping. You don't have to lump it together. So if you wish to see if there's a difference in cataloging of say Latin American material and German, you have your records, because of individuals performing this type of cataloging. Keep it separate and then you're able to judge the difference in time and cost between the two.

Q: May I ask a certain question that has puzzled me for quite some time? Is there any justification in your opinion that say taking cataloging or book selection in one cultural linguistic area should cost more than the other for the same type work? In other words cataloging a book in English by an English speaking person takes time.

Is that or should that be easier than say someone with a background in Arabic?

A: This is a very difficult question for me to answer regarding justification. I would say as a manager I'd rather be aware of any difference and then try to decide the reasons for the difference. I wouldn't like to say that it should be more difficult in one area than another.

Q: But do you believe that there is a difference?

A: There's a difference. There's a difference in filing a catalog card in one library and filing a catalog card in another library. Some may have to run around the block to file it, others may be able to walk straight to the catalog and file it. Things vary.

Q: May I ask if the survey was designed for the operations of library administration?

A: Oh, yes.

Q: So that this in a way was evaluated?

A: Yes. It's difficult to get details of supervision but time devoted to supervision or available for supervision can be obtained.

Q: I think that after you give these women some time you then equate them with the salary of the person performing the work. Is that a fairly complicated process?

A: No, I don't think so. You can take very basic costs or salary costs and add a 10 percent for superannuation schemes, plus national health and insurance, and so on. You can arrive at an hourly rate.

Q: Do you have a formula for overhead rating like that for the administration costs of these operations?

A: No, I haven't worked on this overhead aspect. We were really looking at time because we thought that if you have time that is a better measure of comparability than cost because you can have two catalogers (one making $10,000 a year and the other making $5,000 a year). Not that this happens. Don't quote me. You can say it's more costly, but it's the amount of time devoted to this process and it's the salary that's different.

Q: A few of us in American librarianship are concerned with a sort of conceptual model of the library. We look at the library as a social agency. As a social agency the library is characterized by having certain functions and related to these functions are certain identifiable activities. Under the cluster of activities would be jobs, jobs in turn made up tasks, tasks in turn made up elements. In Britain how do you view this whole hierarchy?

A: I would not say that we view the library any differently than here. We don't have these sort of job descriptions and task definitions. Of course, having done this type of survey you can very easily bring out your job description, can't you? Just by taking these sheets, you could write basic job descriptions and tasks for your whole library. I do think we ought to get on because I have another two surveys.

The other two projects I will describe are concerned with the readers and the library activities. One part of our brief has been the study of user's problems and the ways in which knowledge of those problems can be transmitted to the librarian. One problem is the non-availability of known items, both of the shelf and in the catolog when the reader comes to look for them. We have termed this non-availability failure. Failure by the reader to obtain the item desired. This does not by any means imply that the reader is always at fault, but he failed because he did not look at the right place on the shelf, or because he did not use his intelligence or his energy in searching the catalog. There are many reasons for failure, of course, or non-availability--books being on loan, bindery, reader not being given an accurate reference, library not owning the book, etc. We studied these various aspects of failure. A few of the questions we thought required an answer were these. (See sample H).

Surveys in America or this country, and in Britain have shown that in some libraries up to 50 percent of readers' requests are for books that are not on the shelves at the time. So we consider these a very important set of questions which are particularly difficult to answer in an open access library. To tackle this problem of non-availability we developed a simple and direct survey which required little clerical work and staff time. Readers were asked to record their failure to find a book on the shelf by placing a pink slip in place of the book they were looking for. I'm sure I have some pink slips here. (See sample H_1). Then our invention, this was a great piece of research on the paper clip. If you open a paper clip, so, you can then hook the slips and make a bundle of failure slips, which you can then hook onto the shelves. We have not yet found any shelves where the paper clip doesn't fit. So we have our bundles of pink slips and a paper clip. These pink slips are hung in bundles every six feet or so along the shelves. All the reader had to do if he could not find what he's looking for on the shelf was to pull offa slip, and write in the call number, shelf mark or whatever you'd like to call it, record his status, and in this particular library put it where the book should be. At Cambridge we have running numbers. At other libraries you don't have this method of filing or shelving books so we provide a box and he puts it in a box on a shelf. I'd like to go through the Cambridge one where we have the running numbers. We were able to identify where the books causing failure had been.

We're now at the state where we have failure slips on the shelf and books coming back into the library. We identified by status where those books had been by putting a colored slip of paper into each book that was returned to the desk--one color for M. A. borrowing (at Cambridge we have M. A.'s that are allowed to borrow for a full quarter) and B. A. borrowing two weeks. So we have two colored slips. When those books were reshelved, they were married to the slips. As the book was replaced, the slip was pulled out and married to which ever color was in that book. Books we shelve with no slips obviously signified items that have been used internally within the library.

We therefore started getting some idea of division of failure. Now to some of the results. (See samples I, J, K, L). In one library the response rate of the survey was 67 percent, 10,000 slips completed over the survey period. The causes of failure over two terms were remarkably consistent. M. A. borrowing which I have explained, internal use, and other borrowing each accounted for about 30 percent of the total failure. When we examined individual classes of books, we found the same degree of failure from one term to the next. We were able to provide amount of failure by area or classes within the library, so you can pinpoint your high failure areas within a library by floor, stacks, etc. One in eight books borrowed by M. A.'s caused failure. One in twelve borrowed by B. A.'s caused failure. One in six borrowed by third year undergraduates caused failure, etc., etc. These are just some of the results we got. We can go on and on. If one applies the response rate to those figures, 67 percent, the figures would have been one in five for M. A., one in eight for B. A., and one in four for third year undergraduates. Many of the books caused more than one failure.

I think this next one is critical. About 500 books accounted for just under half the failure. To put it another way 500 books out of half a million in open access accounted for half the reader failure. I think this is a very significant type of quantification. One week after failure over half the books have not returned to the shelves. After three weeks a fifth were still out. Then we started to look at categories of borrowers. (See sample L). Each category of borrower caused more failures to users from its own status group than to borrowers from other status groups. Internal use accounted for 1/3 of the failure for each status group except for first and second year undergraudates, where it was nearly 1/2. M. A.'s may read different books from undergraduates, but not in the area where it hurts most, where books are failing. The ability to calculate success and failure rates for different sections of the library produces a ratio of internal to external book use by areas of the library. The waiting time from the recording of failure to the return of a book used internally was approximately 23 days. I'll have to skip through some of these.

Waiting time for books borrowed by B. A.'s and third year undergraudates was ten and eight respectively. Books borrowed by M. A.'s caused an average waiting time of one month. One in 33 of those readers failing made a recall. I think these are just a few of the results one can get. It also produces things like causes of failure. (See sample N). These are the figures for two terms. Normal borrowing, internal use, relabeling, binding missing books, overdue books, looking in the wrong place, etc. You start to get an idea of the causes of failure. Any questions?

Q: The book may be misfiled somewhere within the library.

A: Missing books would cover that one. Spring two percent, Autumn 2.7 percent. That's missing whether it was stolen, let us say unauthorized borrowing or hidden or misfiled. Failure by class mark gives you an idea of high failure areas by classes. I think this sort of information is an important aspect when considering budget decisions. Where should I be putting my money? Such information gives you a very good idea. Failure by floors, by status, by classification, etc. as here (see samples O and P) I really could go on and on with many other tables to analyze. What I'm saying is one piece of paper (the failure slip) can provide you with this sort of information.

Q: How long did the study last?

A: We did this particular one for two full terms. We have done it, of course, in many other libraries.

Q: How did you request reader participation?

A: We advertised. We put notices on the stacks such as "If the book you want is not on the shelf, please leave a failure slip in its place. Pink failure slips will be found on the shelves. Please record the class mark of the book on the slip. If it is not known, author and title may be substituted." They were also on the table and desks. The cooperation was very, very good. It has been good in every library we've been in. The reason we think is that the reader feels he can register his frustration. I'm sure some of them would have loved the failure slip to be weighted with a lead end so they could throw it at the shelf.

Q: How did you establish what the response rate was?

A: We carried out an interviewing technique in addition to the normal failure survey--a survey within a survey. Twice a day for 1/2 an hour we'd interview readers and ask, "Have you found everything you wanted in the library?" If yes, "How many items were you looking for?" This also gives us an additional measure of library uses. "If you failed, did you record that failure?"

Q: How many of these slips were not useful because there wasn't enough information on them?

A: Very little actually, because we did not ask for a lot to be recorded. You can also do many things with these slips after you itemize them--give them to your subject specialists, selections, etc.

Q: Were there many slips you could not process?

A: Very, very few that we could not deal with, because we ask them the minimum.

Q: Has this been published also?

A: Yes, this has been published. This is Journal of Documentation, 27 (4) December 1971.

Q: Would there have been any way of including in the data how long the book had been on loan before it was returned to the shelf in relation to the time in which the failure occured?

A: Yes, we could have, but the thing is, we could only do that for items borrowed and taken out of the library. You have no records at all for internal use, which could be a high percentage of use.

Q: As a result of this did you analyze the length of loan period to perhaps arrive at a more equitable loan period and result in a lower ratio of failures?

A: I think the whole problem with loan period is that it doesn't really matter how long a person has an item out of the library until it causes failure. We say 500 books caused 1/2 the failure. You must start thinking in terms of that. "Am I going to get additional copies, create a short loan collection, variable loan policy, etc., for certain material or all?"

Q: Did you try to see if the books were, for example, to be used for large course assignment?

A: The main failure areas are what I'd call the textbook type of material, at least in this particular survey. As you see the high failure was on three main floors. We took the results to a department library and examined them against their records and items on reading lists, etc.

Q: Could you make this slip a reservation slip or request for recall?

A: We were toying the idea of making this slip a reservation slip, but we thought it would bias the response rate for failure. We find that not every person that fails to find something is prepared to wait for it to be recalled or obtained. We didn't wish to bias the results. I know one librarian who employed this particular technique. They changed it slightly and made it into a sort of recall-reservation type thing. His response rate decreased. He still, of course, received considerable quantifiable data.

Q: What do they do when they fail to find a book?

A: In the majority of cases it's a question of forget it. If they really require it it will be "come back again." With this particular point in mind, I know of one particular library with about a 60 percent failure rate. Sixty percent of the readers come into the library failing to find what they're looking for. When you ask them what course of action they're going to take after failing, it will be "come back again." Now if you go to that library, the librarian standing at the entrance could be saying to himself, "Wonderful. Crowds of people coming into my library." Of course, what they're doing is looking for something they were looking for yesterday or the day before that. This is a question of the correct interpretation of statistics. Statistically I suppose one could say his library is very heavily used.

Q: Were you able to determine in your studie the extent to which people look in the wrong place?

A: Yes, very few were looking in the wrong place. I think I did have it. Very, very low for people looking in the wrong place: 1.7 percent and 1.3 percent. They did seem to find their way around quite well. Now may I go on to the final study.

Now to something we term catalog failure. Many previous surveys including one of our own show that the readers' approach to finding a desired book more often than not consists of looking on the shelf, first, then sometimes consulting the catalog. Figures like 38 percent consulted the catalog first, while 10 percent went straight to the shelves; 37 percent catalog first, 52 percent using the catalog only if they could not find the book easily elsewhere. Of 128 failures to find specific books, 16 percent had looked in the catalog, 78 percent had looked only on the shelf.

With this particular study some of the questions, again, we thought worth answering were (See sample Q). Where did different sorts of readers get their references? Are the titles in the catalog? What were the readers' apparent problems of finding them? Where did the references they used come from? Was one type of reader more prone than others to a certain type of failure? What were the dates and places of publication of titles not found by readers?

To get back to this particular study we have two objectives: (1) to discover the size of the catalog failure problem and the reasons for it, and (2) to develop a simple system for conveying this information to the librarian without being too time consuming. Again catalog failure slips were distributed around the catalog. Again a very simple form (See sample R). On one side of the form they put in author, title, source of reference, their status. I wouldn't bother about the supplementary catalog information that's peculiar to Cambridge. On the reverse of the form we had a sort of checking list for library use and we checked these out to establish causes of failure.

In addition to that, we had interviews with a sample of users. This was the second part of the survey. Questions were (See sample S). The purpose of this was to provide a basis on which to judge the number and scope of the completed failure slips collected.

Example: What proportion of the total failure recorded by interviews did they represent? Were the proportions of each type of reader who filled in query slips similar to the proportions of those interviewed? The interviews also gave a basic sort of information on the action readers intended to take if they had failed; that is, not finding the desired item in the catalog. In the four libraries, we did this survey in four libraries, the estimated full item failure was 2,035; 2,200; 960; and 557 (See sample T). These are libraries of varying size. Total number of readers interviewed, readers not fully satisfied, the reader failure rate, then we have readers filling in inquiry slips correlation rate and so on. You heard me mention previously that expectation of finding a desired item in the catalog was not as great as where those going to the shelf to find the item. The correlation ratio for this type of survey was much lower than for the shelf failure. However, you can still get some information. Failure rates for different types of readers are produced. Undergraduate, post graduate, research students, and academic staff; the action they planned to take having failed revealed things like (See sample U):

recheck reference	5%
look on the shelf	2%
ask librarian and staff	11%
try interlibrary loan	2%

In four libraries "Forget it" rated 28, 29, 11, and 19 percent--a high rate. Interlibrary loan figures were very revealing. Try another library--Cambridge 18 percent, Leicester

14 percent, Institutute of Education 39 percent (of course it's location is near to Senate House). The location of other libraries obviously influences readers' behavior.

Many correlations, of course, can be made from this sort of information. In one library 54 percent of the references were directly or indirectly the responsibility of the academic staff. About one-half of the titles attributed to references from academic staff were not in the library. This is revealing. In another library over 40 percent of the books not found in the catalog by readers were found by checkers actually to be in the library at the time, 26 percent being in the catalog, 16 percent being in process. Another table (See sample V) on date and place of publication.

We were talking previously on effectiveness and the amount of backlog within a catalog department. What is the effect of the backlog? Well here our backlog contributed to about 16 percent of the failure as far as catalog use is concerned. You're starting to get broad measures. Author surnames provided one of the biggest identifiable problems for the readers. Generally the name was mispelled and readers had not tried any alternative spelling. There is, of course, much more information that can be obtained on this survey technique which I could give but we hope to publish this particular article very soon. When you can say 40 percent of the failures were caused by incorrect source of references, we ought to make this known to academic staff. It is pointless for these users coming to the library, failing to find it in the catalogs, and blaming the library. I think these simple sort of techniques enable a librarian to justify his library performance.

Now I think I've spoken long enough, but just to sum up very briefly I think we've used simple methods of conveying valuable information or reader behavior and needs to the librarian. Very simple techniques which I think give you a fair amount of quantified information. A management consultant is often described as a person who borrows your watch, and then proceeds to tell you the time. What we at the library management research unit area are saying is, "Librarians, tell your own time, but the watch as of yet has to be designed." Thank you.

SAMPLE A

PRIMARY ACTIVITY FORM
LIBRARY MANAGEMENT UNIT INFORMATION SYSTEM

NAME:________________________ LIBRARY:________________________

PERIOD FROM:_________ TO:_________ GRADE:________________________

Please record details of all tasks carried out except those of ________________________. If the process is in connection with periodicals prefix data with 'P'. In addition please record leave, sickness, compensatory time off, etc.

Date	Details	Units	Hrs. Mins.	Date	Details	Units	Hrs. Mins.
				Time worked outside normal hours			
				Date	Details	Units	Hrs. Mins.

SAMPLE B

NAME:________________________

PERIOD FROM:__________ TO__________ GRADE:______________

Please record details of tasks carried out between______________ and________________in connection with the processes shown below. Use the pink sheet to record tasks carried out after____________

Process	Date	Time taken Hrs.& mins.	No. of Units	Process	Date	Time taken Hrs.& mins.	No. of Units
....				....			
....				....			

SAMPLE C

NAME Mrs . . . . CATALOGING								
PERIOD	1		2		3		4	
DATES	24 JAN - 29 JAN		31 JAN - 5 FEB		7 FEB - 12 FEB		14 FEB - 19 FEB	
	HRS. MIN	UNIT	HRS. MIN	UNIT	HRS. MIN	UNIT	HRS. MIN	UNIT
TOTAL TIME AVAILABLE	37.30		37. 30		37 30		37 30	
TIME LOST ON CTO			4 00		9 00		4 30	
ILLNESS	3							
NET AVAILABLE TIME	34 00		33 30		28 30		33 00	
OTHER TASKS								
TRACING RES. BOOKS	53	9						
COUNTER	8 30		8 30		8 30		9 30	
SECOND COPIES	2 00							
CHECK INVOICES	2 00	134						
CHECK ORDER	20							
SLIPS TO BOOK ORDER			2 00	140				
WR BOOK CARDS					6.08	322	5.47	278
CHECK					1.42	283	1.50	255
SUPPLIES					.10			
BK CARDS POCKET LABEL CHECK					4 35	106	6 00	180
PHOTOCOPY					.50	80		
DATE LABELS & PECK					1.27	380	2 .15	196
BOOK POCKETS					.22	92		
MEETING					15			
STYLES							2 00	63
LABELS							.20	66
TOTAL	13.43		10.30		24.14		27.42	
REMAINING TIME AVAILABLE FOR CATALOGING	20.17		23 00		4.16		5 18	

SAMPLE D

TASK SUBJECT SPECIALIST(B)									
	PERIOD	1		2		3		4	
	DATES	24 JAN - 29 JAN		31 JAN - 5 FEB		7 FEB - 12 FEB		14 FEB - 19 FEB	
		HRS MIN	UNITS	HRS MIN	UNITS	HRS MIN	UNITS	HRS MIN	UNITS
BASIC	FULL TIME	112 30		112 30		112 30		112.30	
	PART TIME								
	TEMPORARY								
	TOTAL	112 30		112 30		112 30		112 30	
GAINED									
	TOTAL								
	GROSS TIME AVAILABLE	112 30		112 30		112 30		112 30	
LOST	CTO	15 30		12 30		13 00		16 00	
	LEAVE			15 00					
	SICK								
	OTHER ABSENCE								
	TOTAL	15 30		29 30		13 00		16 00	
LENT	COUNTER	10.45		10 00		10.30		15.00	
	SHELVING	3.44		1 35		4.11		2.53	
	ILL	2.55	43+	2 45		2 .14	52	3 .03	76
	PERIODICAL							.14	
	TOTAL	17.24		14.20		16.55		21 10	
	ALL TIME LOST-LENT	32.54		41.50		29 55		37.10	
	NET AVAILABLE TIME	19.36		70.40		82.35		75.20	
OTHER TASKS	CAT & CLASS	4.15	97	7.40	80			2.41	42
	CAT	15	?	-		7			
	CLASSIFICATION	7 55	3 34	6 26	1 86	17.36	402	9 32	247
	CHECK CAT TYPING	1 58	169	1 14	109+	1 06	100	1 45	225
	CHECK CAT SLIPS	1 30	85	2.50	78			30	20
	CHECK ORDERS	4 25		4.25				6 58	750
	FILE CAT CARDS	48	90	2.20	274+	04			
	CHECK LOANS	54	26	1.11	30				
	CORRESP/ADM/VISITS	1 20		.40		.32		.20	
	CHECK NUMBER IN CAT			.20	25				
	MOVING BOOKS			.20	100			.50	
	FILE ILL SLIPS			.30	90				
	SORT CAT SLIPS			.30	150				
	RESERVE COL					2 00	50	1.33	35
	MEETING					10.10		6 00	
	PHOTO COPYING					.3		.06	
	TOTAL	28 16		28.26		31.38		30.15	
	TIME REMAINING	51 20		42 14		50 57		45.05	

SAMPLE E

Polytechnic Library
Distribution of Staff Time on Various Activities
Period 1--9 a.m.-5:30 p.m. (Jan. 24-29 '72)

Description of Activities & Time		PERIOD 1			PERIOD 2		
		Hrs.	Min.	Units	Hrs.	Min.	Units
Basic	FULL TIME	412	30		412	30	
	PART TIME	89	45		88	45	
	TEMPORARY						
	TOTAL	501	75		501	75	
Gained	OVERTIME						
	TEMPORARY STAFF						
	EXTRA TIME WORKED IN LIEU OF TIME OFF (KEK..)	2	00		2 00	00	
	TOTAL	2	00		2 00	00	
Gross Available Time							
Lost	COMPENSATION TIME OFF	29	30		34	30	
	LEAVE & ETC	7	30		15	00	
	SICK ETC	3	00		4	00	
	TOTAL	40	00		53	30	
Net Time Available to Library		463	15		449	45	
Reader Service Activities	SUBJECT SPECIALISATION	47	20		42	14	
	COUNTER	72	05	IN 125	72	50	IN 133
	ILL	24	35	OUT 37	25	20	OUT 10
	ILL TYPING	2	13	82	5	7	104
	SHELVING AND TYPING	15	50		21	17	
	OTHER READER QUERIES/PHONE	2	45	5	1	15	3
	RESERVE COLLECTION TYPING		33	12		10	5
	RESERVATION	2	05	29	2	35	34
	TRACE RESERVE BOOKS		53	9			
	CHECK LOANS		52	26	1	11	30
	PERIODICALS	13	07		15	10	
	MOVE BOOKS					20	100
	FILL ILL SLIPS					30	90
	SORT BIBL SEC						
	TYPE FOR LIST						
READER SERVICE TOTAL		189	40		184	59	

SAMPLE F

Technical Services Activities		PERIOD 1			PERIOD 2		
		Hrs.	Min.	Units	Hrs.	Min.	Units
Ordering	TYPE ORDER SLIPS	12	20	687	9	05	349
	CHECK ORDERS	4	45		4	25	
	ORDERS	26	49		21	15	
	SLIPS TO BOOK CARDS				2	00	140
	TYPE LIBRARY CARDS						
		44	34		36	48	
Accounts	ACCOUNTS	4	35		9	12	
	FILE INVOICES		15	30		35	47
	CHECK INVOICES	3	20	212	3	01	162
		8	10		12	48	
Accessioning	SORT ACC CARDS				1	25	348
	UNPACKING		10	49		25	164
	ACC & CODE SLIP FILE	5	39	178	4	15	127
	FILE B & W SLIP & ACC FILE	1	35	145		52	108
	FILE CODE SLIP		30	240			
	FILE CONG & AUTHER SLIPS		53	134		15	15
	FILE OP SLIPS		10	19			
	FILE P ORDERS		10			7	24
	DISTR BKS TO S S		11			11	36
	- - . . .	12	50		12	08	
Catalog and Class	CAT & CLASS	9	15	97	7	40	80
	CAT 1	20	02	191	23	00	227
	CLASS	2	55	336	7	58	198
	CAT 2	33	35	250	28	30	152
	CAT(P)	3	0	156	1	05	78
	CHANGE CAT ENTRIE		10	2			
	SECOND COPIES	2	00	-			
	TYPE CAT CARDS		53	25		13	7
	CHECK CAT TYPE	1	52	109	1	19	115
	CHECK CAT ENTRY	3	15	196	6	10	238
	- - - - -						
	- - - - -						
		111	20		106	23	

SAMPLE G

		PERIOD 1			PERIOD 2		
		Hrs.	Min.	Units	Hrs.	Min.	Units
Labeling	LABEL		20	68		30	25
	STYLUS	3	30	130	3	45	103
	BOOK CARDS	1	30	50			
		14	10		11	30	
Binding	PARCEL BOOKS		45	250			
	REMOVE SLIPS & PACK FOR BINDING	1	45	212	4	00	
	SLIPS FROM BINDING AND SORT	2	15	250		30	21
	FILE BINDING SLIPS	2	10	475			
		10	55		9	10	
Miscellaneous	CORRESPONDENCE / ADM / VISITS	2	48		1	53	
	PHOTO COPYING	2	35	257	2	44	
	MEETING		30			41	
	SUPERVISION	25	55		30	20	
	CLERICAL	35	13		34	22	
		71	36		73	09	
	TECHNICAL SERVICE TOTAL	201	59		188	37	
	MISC. & CLERICAL TOTAL	71	36		73	09	
	TOTAL TIME ALL ACTIVITIES	463	15		449	45	

SAMPLE H

What titles are in popular demand so that readers fail to find them?

What are the main causes of failure?

In what areas of the library is failure heaviest?

What reader groups are failing and what groups are causing their failure?

How long do readers have to wait until the books which were not available are returned?

Do readers who fail bother to recall books?

How does failure compare with total demand?

Do the same titles fail from one term to the next?

SAMPLE H_1

FAILURE SLIP

If the book you want is not on the shelf, please leave a failure slip in its place, even if you find one there already. Pink failure slips will be found at the shelves. Please record the class mark of the book, and your status, on the slip. If the class mark is not known, author and title may be substituted.

CLASS MARK: ____________

If not known please give:

AUTHOR ____________

TITLE ____________

TICK	STATUS
☐	Resident M.A. (including M.A. status)
☐	Non-Resident M.A.
☐	B.A. & Research Student (Below M.A.)
☐	3rd year undergraduate
☐	1st/2nd year undergraduate
☐	Other reader

SAMPLE I

Some Results

Response rate: 67 percent

Some 10,000 slips completed.

The cause of failure over two terms remarkably consistent.

M.A. borrowing, internal use and other borrowing each accounted for about 30 percent of total failure.

When we examined individual classes of books we found the same degree of failure from one term to the next.

We were able to provide amount of failure by areas or classes within the library.

1 in 8 books borrowed by M.A.'s caused failure.

1 in 12 books borrowed by B.A.'s caused failure.

1 in 6 books borrowed by third year undergraduates caused failure.

SAMPLE J

Each category of borrower caused more failures to users from its own status group than to borrowers from other status groups.

Internal use accounted for one third of the failure for each status group except for first and second year undergraduates, where it was nearly half.

M.A.'s may read different books from undergraduates, but not in the area where it hurts most--where books are failing.

The ability to calculate success and failure rates for different sections of the library produces a ratio of internal to external book use by areas of the library.

The waiting time from the recording of failure to the return of a book used internally was approximately 23 days.

SAMPLE K

The waiting time for books borrowed by B.A.'s and third year undergraduates was 10 and 8 days respectively.

Books borrowed by M.A.'s caused an average waiting time of one month.

One in 33 of those readers failing made a recall.

SAMPLE L

By applying the response rate the true figures would be

1 in 5 for M.A.'s
1 in 8 for B.A.'s
1 in 4 for third year undergraduates.

Many of the books caused more than one failure.

About 500 books accounted for just under half the failure.

To put it another way, 500 books out of half a million in open access accounted for half the reader failure.

One week after failure, over half the books had not returned to the shelves; after three weeks one fifth were still out.

SAMPLE M

Failure By / Borrowed by	Total	M.A.	Non-Res. M.A.	B.A.	3rd Year	1st/2nd Year	Other	Unknown
M.A.	1683	301	43	199	536	437	44	123
B.A.	412	50	2	63	140	119	7	31
3rd Year	1283	105	13	120	606	304	13	122
Internal	1909	222	29	181	590	656	31	200
Labelling	42	6	1	4	3	8	0	10
Binding	18	4	0	4	5	4	0	1
TOTALS	5347	688	88	571	1890	1528	95	487

SAMPLE N

Cause of Failure	Number of Slips		Spring 70	Autumn 69
M.A. Borrowing	1675		26.9	27.9
B.A. Borrowing	407		6.5	28.9
3rd Year Borrowing	1279	5317	20.6	
Internal Use	1896		30.5	28.5
Re-labeling and Re-binding	60		1.0	0.6
Missing Books	124		2.0	2.7
Overdue Books	38		0.6	0.6
Unaccounted for	355		5.7	3.5
Incorrect Copying of Class Marks	176		2.8	4.2
(Including 37 old class marks which had been changed by the Library		903		
Looking in the Wrong Place	104		1.7	1.3
Unknown (Book found with slip on shelf)	106		1.7	1.9

As can be seen from the table the two terms' figures are very similar, not only for the main categories of borrower but also for such causes as 'looking in the wrong place'.

SAMPLE O

Class Mark by Floor		Type of Borrowing					Total
		M. A.	B. A.	3rd	Int	L&B	
N. W. Ground	1-238	569	164	495	522	9	1759
N. W. 1	240-364	188	43	73	134	9	447
N. W. 2	365-449	85	18	47	39	1	190
N. W. 3	450-536 RA-RH	125	22	100	111	6	364
N. W. 4	537-689	203	74	307	390	10	984
N. W. 5	690-799 900-999	336	59	159	294	11	859
S. W. 3	P1-P340	78	11	46	114	4	253
S. W. 4	P340-P448	6	2	9	20	--	37
S. W. 5	P460-P898	66	13	33	253	8	373
S. E. 5	P900-P999 (± Oddments)	19	1	10	19	2	51
	TOTAL	1675	407	1279	1896	60	5317

SAMPLE P

Class Mark	Type of Borrowing						%	
	M.A.	B.A.	3rd Year	Internal	Labelling and Binding	Total	Spring 70	Autumn 69
0-99	45	20	39	64	1	169	3.2	3.0
100-199	176	59	121	138	4	498	9.4	7.6
200-299	414	102	360	369	6	1251	23.5	20.0
300-399	163	30	66	107	7	373	7.0	7.3
400-499	98	24	60	44	6	232	4.4	5.9
500-599	233	59	233	338	11	874	16.4	14.2
600-699	42	24	143	141	-	350	6.6	9.9
700-799	323	58	148	273	11	813	15.3	16.4
800-899	4	--	--	2	-	6	0.1	0.2
900-999	4	1	1	8	-	14	0.3	0.3
P1-P340	78	11	46	114	4	253	13.8	14.6
P340-P448	6	2	9	20	-	37		
P460-P898	66	13	33	253	8	373		
P900-P999 ± (Oddments)	23	4	20	25	2	74		
TOTAL	1675	407	1279	1896	60	5317		
%Spring 1970	31.5	7.7	24.0	35.7	1.1		100.0	
%Autumn 1969	32,5	33.6		33.2	0.7			100.0

SAMPLE Q

Where did different sorts of readers get their references?

Where were the titles from the various sources of reference located (by staff searches)?

Of the titles found to be in the catalog, what were the reader's apparent problems in finding them, and where did the references they used come from?

Was one type of reader more prone than others to a certain type of failure?

What were the dates and places of publication of titles not found by readers?

SAMPLE R QUERY SLIP

Recto

CAMBRIDGE UNIVERSITY LIBRARY

Catalogue Query Slip

Please fill in this slip if you cannot find what you are looking for in the catalogue.

Use a SEPARATE slip for each item not found in the Catalogue.

Underline all names and words which you checked.

AUTHOR or other person or organization responsible (if known):

TITLE, date, other information about the book, periodical, etc. (if known):

SOURCE(S) of this reference:

- Lecturer/Supervisor ____
- Reading list ____
- Book/Periodical article ____
- Separate bibliography ____
- Colleague/Friend ____
- Reviews ____
- Publicity media/ Bookshops ____
- Other ____

YOUR STATUS:

- 1st year undergraduate ____
- 2nd year undergraduate ____
- 3rd/4th year undergrad. ____
- Affiliated student ____
- B.A. & Research student ____
- Resident M.A. ____
- Non-resident M.A. ____
- Other ____

If this query originated in the Supplementary Catalogue please check here:

(____)

Verso

FOR LIBRARY USE ONLY

- ____ Main Catalogue
- ____ Supplementary Catalogue
- ____ Bibliography

- ____ Not yet catalogued
- ____ On order
- ____ Not on order

- ____ Author's name
- ____ Surname
- ____ Forname
- ____ Corporate body
- ____ Form heading

- ____ Edition
- ____ Insufficient information
- ____ Not in catalogue
- ____ Other

SAMPLE S

1. Did you find all the items you were looking for in the catalogue?
2. How many items were you looking for? (If YES in Question 1, go on to Question 6)
3. How many did you find?
4. Did you fill in a Query Slip at the Catalogue for each item not found?
5. What further steps, if any, do you plan to take to obtain the item(s) you could not find?
6. What is your status in the university?

SAMPLE T Interviews - Profile of responses

Profile of responses	Cambridge	Leicester	Inst. of Education	Bradford
Readers interviewed:	446	262	369	193
Readers not fully satisfied:	110	90	105	69
Reader failure rate:	25%	34%	28%	36%
Readers filling in query slips:	31	14	7	7
Reader cooperation rate:	28%	16%	7%	10%
Individual items looked for:	1370	713	827	413
Individual items not found:	193	204	179	106
Item failure rate:	14%	27%	20%	26%
Query slips reported filled in:	39	15	10	7
Item cooperation rate:	20%	7%	5%	7%
Estimated full item failure:	2035	2200	960	557

SAMPLE U Interviews - Action planned after failure

Action planned after failure   Proportions of readers intending different types of action in:

	Cambridge	Leicester	Inst. of Education	Bradford
Total no. of readers failing:	110	90	105	69
Recheck reference:	5%	--	--	7%
Look on shelf:	2	17%*	10%	9
Ask library staff:	11	18	35	13
Ask supervisor/colleague:	12	4	5	2
Look in bibliography:	6	2	5	1
Attempt to purchase:	6	3	10	--
Try another library:	18	14	39	25
Try interlibrary loan:	2	12	3	9
Recommend to library:	2	--	1	3
Try to find substitute:	4	1	4	7
Other:	4	2	17**	4
Forget it:	28	29	11	19

* Includes 13% who said they would look on the shelves of unprocessed books within each subject area.

** Includes 13% who said they would reserve it--in this library this means filling in a card for a book not found, whether in the catalogue or on the shelf.

SAMPLE V Results of search at Cambridge

Results of search	Date of publication						Place of publication				Total no.
	1970	'68-69	60-67	1900-1959	Pre-1900	Not known	Gr. Brit.	North Amer.	Other	Not known	
	in percent						in percent				
In catalogue	6	16	34	36	8	1	58	30	13	--	106
In process	70	20	8	2	-	-	56	38	6	--	64
On order	50	13	13	25	-	-	38	38	25	-	8
Remainder (identified)	10	18	29	36	8	-	13	53	34	-	198
Remainder (not identified)	23	-	3	-	-	74	19	10	6	65	31
Percent of total	20	16	25	28	6	6	32	41	22	5	
TOTAL NUMBER	81	66	100	112	24	24	131	167	89	20	407

DEVELOPING LIBRARY SERVICES FOR GRADUATE PROGRAMS; PARADIGMS, MODELS, AND QUANTIFICATION*

Alan R. Taylor

> From the beginning the university acted on the principle that one of the essentials of a University was books, more books, and still more books. -- from Thomas Wakefield Goodspeed, *A History of the University of Chicago*. 1916.

Scholarly librarianship is an ancient and venerable profession, with roots set in antiquity when man first began to create and store written records. In terms of seniority, the art of librarianship precedes the science of mathematics, which had its proper beginnings much later in Greece, six centuries before the birth of Christ.

Universities, and hence university libraries, had their origins in Europe during the Middle Ages. In North America, the first institution of higher education, Harvard College, was founded a mere sixteen years after the arrival of the Pilgrim Fathers at Massachusetts Bay Colony, just over three and one half centuries ago.

The modern American graduate school was born with the founding of Johns Hopkins University in 1876, the same year that our own professional organization, the American Library Association, was established.

Yet few academic librarians consider it at all strange that, after the passage of these long periods of time, we are still discussing the fundamental problem of librarianship implicit in our conference title. Is it really the case that we are still so uncertain of our goals, that we are unable either to state them or to quantify them to the satisfaction of our clientele on the one hand or--even worse-- to our university presidents on the other?

During the last quarter century in this country, we have witnessed the proliferation of our graduate professional library schools, but this proliferation has been a process accompanied by a mounting dissatisfaction with the content and quality of professional education. Enormous sums of money have been spent on university libraries and library resources, yet we have witnessed a mounting dissatisfaction on the part of library users with the quality of library services. University library staffs have grown in numbers, calibre, and responsibility, yet librarians are increasingly dissatisfied with the present mode of academic library administration. Academic librarians' salaries and fringe benefits have increased, yet librarians are more thoroughly dissatisfied with their prestige and the status accorded their profession within the university framework. In spite of the widespread adoption of fairly sophisticated technological innovations capable of handling library and bibliographical data, there appears to be a mounting sense of schism between information scientists and traditional librarians in a profession which has hitherto been extraordinarily reluctant to depart from a standardized pattern of professional education or organization.

All these paradoxes--and one could mention other curious phenomena--and the widespread existence of anomalies in our library systems, are characteristics of a profession in a serious state of crisis.

How should academic librarianship then, as a profession, seek to resolve these paradoxes, root out anomalies and obviate the crisis?

By training more highly qualified librarians? Our recent doctorates in library science appear to be experiencing difficulty enough in finding suitable employment.

By raising educational standards for entry to the profession? Already the reduced demand for academic personnel in other fields has resulted in a rush of well-qualified entrants to our library schools.

By increased research? Far too much of the research that has already been conducted tells us with ever-increasing precision just how bad our circumstances are, but leaves us with little information which could serve as a valid basis for successful innovation and change.

By increased reliance on computer technology? Such reliance has not enabled us to enhance our service capability in those critical areas, which are concerned with the demand for traditional library materials, bibliographical advice, and personal wisdom.

By increased training in the field of information science? It seems apparent that too few librarians are utilizing the knowledge they already possess in this area.

By increasing federal funding to academic libraries? The increased funding over the past two decades has, to a large extent, created many of the more intractable problems we are now struggling to solve.

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* A slightly revised version of a paper presented to the Fourth Annual Library Science Institute on "Library Management: Quantifying Goals;" at Indiana State University, Terre Haute, Indiana, April 28, 1972.

Today the human and physical resources which we command represent too great an investment, and the services which we render to society are too important for us to rely, to the extent that we have in the past, on hallowed long experience and intuition as our major problem-solving devices. It seems to me that our problems are fundamentally intellectual in nature, and that if this is indeed the case, then solutions to them have to be sought in intellectual ways.

I would like to suggest that the conceptual framework set forth by Thomas S. Kuhn in his book, *The Structure of Scientific Revolutions,* offers a useful intellectual instrument with which we may begin to grapple with some of the problems which beset us. By focussing on the particular set of problems contained in the development of library services for graduate programs, I hope to be able to demonstrate the applicability of Kuhn's concepts to one field of library science, and hence to validate the suggestion that they may be suitable for use in other critical areas.

Kuhn's essential contribution to our understanding of the nature of scientific progress is based on the concept of what he calls "paradigms," which he initially defines as "universally recognized scientific achievements that for a time provide model problems and solutions to a community of practitioners."

Kuhn's publication of 1962 is extrordinarily rich in original thought, not all of which is expressed with absolute precision, however. His ambiguities led one critic to complain that the term "paradigm" had been used in at least twenty-one different ways. One has to turn to the second edition of this important work (1970) and the postscript thereto in order to obtain a clearer notion of the essential concept of paradigm. Here Kuhn elaborates his ideas, refines his definitions more precisely, and replies to some of his critics.

"Paradigm," he admits, had been used in the first part of his book fundamentally in two different senses:

> "On the one hand, it stands for the entire constellation of beliefs, values, techniques and so on shared by the members of a given community. On the other, it denotes one sort of element in that constellation, the concrete puzzle-solutions which, employed as models or examples, can replace explicit rules as a basis for the solution of the remaining puzzles of normal science."

Expressed in other words, though indeed somewhat circuitously:

> "A paradigm is what the members of a scientific community share, and conversely, a scientific community consists of men who share a paradigm."

"Normal science" is that brand of science which is practiced under or in terms of a pre-existing paradigm, and is one of the ways in which a particular paradigm is articulated. Its essential characteristic is general agreement upon a basic theoretical framework in which a community of practitioners shares sets of common assumptions. This agreement is, of course, implicit in their undertakings, and is rarely made explicit, though the fundamentals of normal science may be inferred from textbooks, the journal literature and the other means of discourse between practitioners of the specialty.

There comes a point, however, in which new data are amassed, or new phenomena are discovered which fail to "fit" the pre-existing paradigm, and anomaly occurs. A multiplicity of anomalies gives rise to a state of crisis within the discipline or speciality and sets off a search for new theories (extraordinary science) which will be hospitable not only to the new data or the new phenomena, but to the pre-existing data and phenomena as well. When this has occured on a massive scale, and a completely new paradigm is established, a scientific revolution may be said to have occurred.

This process is, of course, by no means so simple as it sounds. Many practitioners of the specialty may never repudiate the older paradigm and accept the new. As Kuhn points out:

> "The transfer of allegiance from paradigm to paradigm is a conversion experience that cannot be forced." *

Apart from demonstrating that some scientific "revolutions" may take place over an extended period of time--over a hundred years in the case of Copernician astronomy--Kuhn makes another significant point when he hints that:

> "...it is sometimes just its reception of a paradigm that transforms a group previously interested merely in the study of nature into a profession or, at least, a discipline,"

As far as the social sciences are concerned however, Kuhn considers that:

> "It remains an open question what parts of social science have yet acquired such paradigms at all. History suggests that the road to a firm research consensusis extraordinarily arduous."

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* The same point was made much earlier by Max Planck:

> "A new scientific truth does not triumph by convincing its opponents and making them see the light, but rather because its opponents eventually die, and a new generation grows up that is familiar with it."

In spite of Kuhn's strictures--or possibly even because of them--a number of social scientists are beginning to adopt Kuhn's concept of paradigm as an intellectual tool for their own purposes, and I see no reason why librarians should not do likewise. As Alvin Toffler points out:

> "Theories do not have to be 'right' to be enormously useful. Even error has its uses." *

In terms of Kuhn's framework the present crisis in academic library science may be conceptualized as a paradigmatic crisis. Our profession is undergoing a search for new theories--the period of "extraordinary science"--which will establish a new paradigm. But Kuhn's model posits a continuum: original paradigm--normal science--anomaly--paradigm breakdown--crisis--extraordinary science--establishment of new paradigm. One's normal initial reaction to all this is to reject the applicability of the model to library science on the grounds that library science never had anything like a paradigm in the first place. This was certainly my own reaction before I undertook a more careful re-evaluation of the historical evidence and revised my "conceptual Gestalt."

I hope to be able to demonstrate that there was indeed an earlier professional paradigm, and it served a useful purpose for many years and enabling a "normal science" of librarianship to develop and achieve maturity, but that it broke down so long ago that our profession has forgotten its earlier paradegm. In the subsequent years, as anomalies and crises have increased and proliferated, we have become accustomed to them as a normal condition of professional life, and have tended to assume that solutions may only be sought by pragmatic means.

The first paradigm under which academic librarianship developed was predicted simply on the acquisition and care of the manuscript book as a physical object. The linguistic evidence for this view is powerful enough as it is. The English word "library" is derived from "liber," the Latin word for a book, and analogs in the European languages with which I am familiar are derived either from the same root or from the Greek equivalent, "biblios." The library was a special kind of repository wherein books were to be stored; the librarian was a special kind of custodian.

Interestingly enough, the major technological innovation of the fifteenth century--the invention of printing with movable type--had little immediate impact on the practice of librarianship. The first printers deliberately modeled their products on the best specimens from the *scriptorium*. Books became cheaper and more plentiful, and libraries, with the passage of time, became more numerous too, but esseentially the printed book was, for all practical purposes, the same as the manuscript book. There is a good deal of evidence to suggest that of the total number of items from the first presses, of those intended for popular consumption, the majority consisted not of books, but of "letters," broadsides, chapbooks and pamphlets, very few of which have survived to the present day. They were not preserved in libraries; they were not books.

Printed books, unlike the more costly manuscript volumes, did not need to be chained, but the mental chains and concomitant attitudes towards books remained. Librarians in general continued to function in their primary mode as custodians and conservators of books right through to the nineteenth century. And quite a few do likewise even unto the present day.

The scientific and other periodicals which had their beginnings in the seventeenth century and which became so important during the nineteenth century appeared to create few major problems for the librarians of that era. The proliferation of scholarly journals in large numbers did not create anomalies or cause a breakdown in the book-based paradigm. Periodicals were sufficiently like books that the libraries could easily absorb them. In fact, by the neneteenth century, librarians generally were becoming rather skilled at arranging and recording the various contents of their libraries. The card catalog, catalog rules and our two most popular library classification schemes were all products of the nineteenth century. Note too, that the classifiers of this era collocated library science with bibliography. This fact seems to me to present further evidence for the existence of the book-based paradigm. A formally adopted classification scheme serves as one of the few instances in which a paradigm is rendered explicit in Kuhnian terms.

One does not have to seek too far to find the reasons for the longevity and endurance of the book-based paradigm. As late as 1922, Edward Wyndam Hulme could assert in his lectures on ***Statistical Bibliography*** that:

> "Every phase of human thought and activity is now promptly and, as a rule, efficiently registered by the press."

The librarian was serving society by acquiring and preserving the artifacts of culture generated by the printing press. It was a noble task in and of itself.

Academic librarians are fond of stating that "library is the heart of the university," and even university presidents may be prevailed upon to repeat this basic truism on certain public occasions. Clearly, the academic librarians' professional paradigm is inextricably linked and interwoven with the paradigms of the professional academicians and with that paradigm--or more accurately the competing paradigms--which support the whole of higher education.

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* A modification of Francis Bacon's dictum:

"Truth emerges more readily from error than from confusion."

If we digress from our own paradigmatic problems for a moment and consider the academicians' paradigm, a brief acquaintance with American intellectual history from about 1850 onward will be enough to make it fairly clear that there occurred in the latter half of the neneteenth century a major paradigmatic shift in the field of higher education. This shift resulted in the formation of the modern American university, partly through the establishment of the Land Grant colleges under the provisions of the Morril Acts (1862 and 1890), and more significantly, through the creation of graduate education. It should be noted that the earliest graduate schools (Johns Hopkins, Clark, Chicago) were not founded in existing colleges, but were created *de novo* as "apices without bases," and some of the more venerable colleges (Harvard, Yale,etc.) went slowly about the business of adding graduate apices to their undergraduate bases in universities which combine the functions of both undergraduate and graduate education. Furthermore, instruction of undergraduates by research oriented faculty members, which the first graduate schools were designed to avoid, is now hailed as good.

The field of higher education is not immune to further paradigmatic change. But the dramatic paradigmatic shift which took place in American higher education when it abandoned its original mode based solely on teaching and adopted a mode which stressed the primacy of research, should have brought about an immediate and equally profound change in the paradigm of academic librarianship. That it failed to do so is fairly clear, and, for the moment, we may offer only a few tentative explanations as to why this was the case. Some of them have to do with our own profession, particularly our own professional education just then getting under way (1887), and some have to be laid at the door of the academic profession in general.

There is little doubt that many individuals have been, and still are, attracted to the library profession in the first place because the role of custodian over books has an enormous appeal. Books do not answer back (Even talking books do not answer back). There is more than a modicum of truth in the popular image of librarians as introverted and shy lovers of books and reading. Thus, to change the underlying paradigm is to impinge upon the core of the collective professional personality. Clearly, our profession posesses many inherent characteristics which make it resistent to rapid change, and, even more importantly, so do the libraries themselves.

What of the external factors which should or could accelerate change? Many university administrators and faculty members have expressed and continue to express interest in and concern with the problems of the university library. This has to be expected. The mutual paradigmatic involvement which I mentioned above implies a two-way flow of ideas, not all of which will be liberal or change-oriented in expression. For every powerful faculty member pushing for change in the university library, there usually exists an equally powerful pulling to maintain the *status quo*. On the subject of open-access for example, one quotation from the 1920's will suffice. It is attributed to Professor Karl Pearson of University College, London, who flatly stated:

> "All books should be kept in cases, of which the librarian alone has the key. Then, if a single one be missing, we shall know whom to hang."

Having stressed thus far those factors which act as deterrents to change, I do not want to appear to be overstating the case by ignoring significant changes which have already taken place. In recent years, some of the smaller and newer college institutions have relinquished the term "library," and have used the term "learning resource center," or similar phrase. These institutions, and the librarians who are working therein have, in effect, repudiated the old book/bibliographical paradigm and are in the process of articulating for themselves a new one, based on the learning needs of their academic communities.

These changes give us a clue to the direction we should move in order to establish a totally new paradigm for the whole community of academic librarians. The book/bibliographical basis has clearly broken down, and I suggest that in attempting to find a viable alternative we focus explicitly and scientifically on the library user. With such a focus we may transform our paradigm so that its basis becomes, in its simplest and briefest form of expression, "the informational and communication needs of the individual." If we go about doing this with care and deliberation, working from basic principles, questioning every step as we go along the way, I think that a number of significant things begin to occur which may permeate to the very foundations of our profession.

At this point, I would urge that librarians no longer tolerate the information scientists' monopoly over the term "information" with its narrow and specialized meaning. I think that we should grab it back again, and make its meaning broader, and wider, and deeper, and enhance it so that by "information" we will mean the collectivity consisting of all facts and truth, opinions and half-truths and the aesthetic and the not-so-aesthetic experiences embodied in novels and poetry--and indeed creative writing of all kinds--which the individual human spirit is to exist in a state of health, and not lapse into a condition of spiritual and cultural pathological malnutrition.

Under such a paradigm books are accommodated, for books are, and are likely to remain, the single most important, useful, and convenient means of satisfying the general information needs of society. Rare ancient, and beautiful books, too, are incorporated into the new paradigm, for society must be able to communicate with its past, and undergo the unique aesthetic experience which is derived from contact with books exquisitely printed and bound. But librarians are liberated, for the new paradigm legitimizes our instinctive interest in other forms of communication--not only the printed variety, but the pictorial and sound media, cine-films and computer tapes, and other artifacts and means not yet invented for the storage and dissemination of information.

With the kind of paradigm envisaged, we acquire a societal base too, and we can no longer afford to have our mental and conceptual set fettered by Dewey's 010 and 020 classes of L. C.'s Z class. Library science immediately becomes one of the social sciences, and, more importantly, one of the behavioral sciences too, becasue communication of information is a social act, and information affects behavior. On the other hand, library science becomes one of the new communication sciences in its own right. While all this places an added intellectual burden on members of our profession, there are some fringe benefits too. For the first time, we begin to acquire a genuine discipline--without which there is no academic respectability. We also acquire all the intellectual and methodological tools of the social sciences, and all the technical apparatus of the communication sciences as well. In fact, the business of being a librarian could become much more lively.

The new paradigm revolutionizes the profession in still other ways. We are transformed from a position of passive custodianship to one of dynamic activism. We can no longer sit on our hands and respond to expressions of individual needs. Instead, we must establish what those needs are, synthesize and make predictions about future needs. Difficult choices will have to be made, but the profession will begin to acquire a rational and scientific basis from which to formulate these choices. Greater responsibility falls upon such a profession once active steps have been taken to comprehend with the fullest clarity and precision just exactly what the information needs of our communities are, how they are expressed, how they can most effectively be met and how individuals consume the product. This does not necessarily mean making value judgments about either product or user, but we could certainly use some greater insight into the information generation and consumption processes.

EVALUATING SCHOOL MEDIA

PROGRAM GOALS

Robert D. Little

The use of newer audiovisual materials in instruction and the centralized housing of large collections of printed resources in school libraries are both twentieth century developments. The literature of these areas is therefore limited to recent years. While the use of audiovisual materials in instruction from its early beginning in 1918[1] has been rooted in a history of research, the period of systematic research in school library field started around 1927.[2] In the school library field much of the research has taken the form of theses and unpublished surveys of existing conditions whereas in the audiovisual area much of the research has attempted to relate methods of instruction using media to learning achieved.

While the early studies and research of school libraries tend to be quantitative the goals for the programs have tended to be qualitative. In 1945 the American Library Association published ***School Libraries for Today and Tommorrow.*** In it they have listed the purposes of the school library program as:

1. Participate effectively in the school program as it strives to meet the needs of pupils, teachers, and other community members.
2. Provide boys and girls with the library materials and services most appropriate and most meaningful in their growth and development as individuals.
3. Stimulate and guide pupils in all phases of their reading so that they may find increasing enjoyment and satisfaction and may grow in critical judgment and appreciation.
4. Provide an opportunity through library experience for boys and girls to develop helpful interests, to make satisfactory personal adjustments, and to acquire desirable social attitudes.
5. Help children and young people to become skillful and discriminating users of libraries and of printed and audio-visual materials.
6. Introduce pupils to community libraries as early as possible and cooperate with those libraries in their effort to encourage continuing education and cultural growth.
7. Work with teachers in the selection and use of all types of library materials which contribute to the teaching program.
8. Participate with teachers and administrators in program for continuing professional and cultural growth of the school staff.
9. Cooperate with other librarians and community leaders in planning and developing an overall library program for the community or area.[3]

These same purposes were included in the 1960 ***Standards for School Library Programs***[4] prepared by the American Association of School Librarians. In both cases, however, quantitative rather than qualitative standards are given as the means of evaluating the program. The assumption probably being that without adequate staff, collection, facilities, budget, etc., it would be impossible to have a program which would be able to carry out the stated purposes. It is interesting to note that in the joint standards published in 1969 by the American Association of School Librarians and Association for Educational Communication and Technology (at the time of publication the name was the Department of Audio-Visual Instruction of the National Education Association) no objectives, purposes for the programs were included.[5] This may or may not be significant.

While new goals or objectives for media programs have not been developed, the School Library Manpower project funded by the Knapp Foundation of North Carolina and administered by the American Association of School Librarians has developed major areas of competencies for the education of school library media specialists which are stated as behavioral objectives. Some of the behavioral objectives listed include:

> To identify and apply appropriate criteria for assessing and evaluating materials and equipment in terms of their purported function and the needs (cognitive, physiological and affective) of the potential user.
>
> To motivate and guide students and teachers in developing reading, viewing and listening competencies, including skills, attitudes and appreciation.
>
> To apply instructional methodology and knowledge of instructional objectives to the place and utilization of media in the educational program.
>
> To evaluate, utilize, and design media technology to facilitate learning.

To interpret the goals and functions of the total media program as it relates to a variety of audiences who support learning, e. g., School Boards, P.T.A., Civic organizations, and industry.

To help colleagues implement clearly defined specific instructional objectives through the utilization of appropriate media.

To participate in and initiate research activitiesthat diagnose, assess, and evaluate learning environments and media support systems.

To support and play a constructive role in professional organizations and activities.

To assess the current status of the program through observation and/or planned research.

To prepare appropriate plans for the media program and to interpret them effectively to the administration of the school and of the school system.

To coordinate the operations of the media center with curriculum planning, the instructional program and the facilities of the total school.

To establish and administer procedures for identifying, previewing, evaluating, and selecting media.

To plan systems for housing media in terms of their characteristics and potential use.

To plan and direct a comprehensive program of instruction and guidance to users in reading, listening, viewing, and use of the media center and its resources.

To contribute to the planning and execution of in-service training programs for the school media staff and faculty.[6]

It is evident that these could be used as a basis for the evaluation of the media program. There is, in fact, a great similarity between some of these and the purposes for school media programs listed in *School Libraries for Today and Tomorrow.*

Although most of the early evaluation of school media programs was quantitative and not qualitative a number of the early leaders in school librarianship recognize the need for evaluating the program. Probably the most significant of these early evaluations of programs and not materials or equipment is that of Frances Henne, Ruth Ersted, and Alice Lohrer in their *Planning Guide for the High School Library Program* published in 1951. An example of the method they used to evaluate the school library program follows:

THE READING GUIDANCE PROGRAM OF THE SCHOOL LIBRARY

A. Information background needed by the school librarian

The school librarian needs a knowledge of all the factors listed below in order to participate effectively in the reading program of the school. The first five statements should be measured on the basis of quality, and the last two statements should be measured on the basis of quantity.

ABCDF
1230 1. The librarian has an understanding of the methods of teaching reading.

ABCDF
1230 2. The librarian knows what are the standard reading achievements that can be expected of students, from the first grade through college.

ABCDF
1230 3. The librarian is familar with reading program in his school.

ABCDF
1230 4. The librarian is familiar with the types and nature of reading tests, their scope, purposes, and use, and he knows how to interpret the scores made by students on tests.

ABCDF
1230 5. The librarian is familiar with the types of reading records that are used in the school. He knows the scope nature, purpose, and uses of these records, and he knows how to interpret the records that are kept of the reading of students.

ABCDF
1230 6. The librarian is familiar with the backgrounds and abilities of as many students as possible.

ABCDF
1230 7. The librarian keeps informed about recent investigations, research, and other developments in the field of reading, and knows the basic books about the readings of young people.[7]

This constitutes one of the first real attempts to evaluate school libraries or analyze programs. Henne and her associates developed an outline for this evaluation basing the study primarily on analysis of the objectives and programs and from this analysis derived the evaluation of the physical provisions required to put a program into effect.[8]

During the 1950's several studies concentrated on the relationship of the school library to curriculum improvement activities. A number of questionnaires or inventories to evaluate the need and effectiveness of school library programs in relationship to the curriculum were developed. For example, Alice Lohrer in 1951 prepared two surveys, "What Do You Think About Our School Library Program," in which she asked questions on the relationship of teaching and library resources.

One of the most recent and comprehensive tools for evaluating school library programs qualitatively and not quantitatively was the questionnaire developed by Mary Virginia Gaver in her study *The Status of Secondary School Media Centers in New Jersey*. The study originally done in 1965 was updated in 1971 with the publication of *Services of Secondary School Media Centers: Evaluation and development*. Typical of the questions included in this survey were:

IN THE MEDIA CENTER THE FOLLOWING SERVICES ARE REGULARLY PROVIDED

Individual guidance in reading is given through:

1 ______ conferences with individuals
2 ______ individualized reading lists
3 ______ assistance in location of reading materials
4 ______ assistance in selection of reading materials
5 ______ parent-teacher-librarian conference
6 ______ conferences with guidance counselor
7 ______ conference with teacher
8 ______ maintenance of reader interest file for students
9 ______ maintenance of reading records for individuals
10 ______ a vacation reading program is provided for students

Media center staff regularly consults with faculty on:

113 ______ resources in special subject areas
114 ______ services
115 ______ resources for instructional units

Media center staff

131 ______ is represented on the school curriculum committee
132 ______ is not represented but works with such a committee
133 ______ in absence of a committee, nevertheless works closely with faculty on curriculum
134 ______ serves as a clearing house for textbooks and other learning materials
135 ______ provides resource collections for classrooms
136 ______ plans classroom presentations with teachers upon request when they require special media productions
137 ______ works with teachers to develop skill in making use of media with both small and large groups
138 ______ counsels teachers in the selection of AV materials
139 ______ counsels teachers in the selection of books

Media center staff works with teaching teams (or dept. groups) in:

140 ______ English
141 ______ Social Studies
142 ______ Science
143 ______ Other subjects (Specify: ______)
144 ______ across subject lines

This team activity includes

145 ______ working with teachers as a bibliographical assistant
146 ______ serving as resource consultant
147 ______ working directly with students
148 ______ reorganizing, etc. the media center so as to facilitate team teaching
149 ______ teaching the use of resources

Media center staff

150 ______ obtains instructional media (from other sources) upon request of teachers
151 ______ acts as one of the channels of information to teachers regarding student progress, problems, or other appropriate data
152 ______ acts as resource person in the classroom upon request
153 ______ makes available to the faculty through a professional collection knowledge of recent developments in subject areas and the general field of education.[9]

Although the *Evaluation Criteria* used by the North Central Association of Colleges and Secondary Schools tend to be quantitative it does also attempt to be qualitative in the services and activities check lists and evaluation sections. An example would be the check list evaluation of services to students:

13. Develop an in-service training program for teachers as well as orientation for new faculty.

16. Systematically inform teachers of new materials and equipment that have been acquired.

19. Assist teachers in the development of resource lists of available materials in special areas.

21. Provide professional assistance in the production of educational media.

25. Provide instruction and encouragement in the use of computer-assisted instruction, dial access, and data storage and retrieval.

27. Cooperate with other members of the staff in acquainting students with the proper and effective use of educational media.

28. Guide students in their selection and use of educational media in terms of their abilities and interests.

29. Assist students to develop discrimnation in reading, viewing, and listening.

30. Assist special-interest groups to use resources of the educational media center in the promotion of their projects.

32. Acquaint students with the use of a network of libraries and information centers.

EVALUATIONS

( ) a. How adequately do members of the educational media staff work with teachers in selecting materials?
( ) b. How adequately do members of the staff serve teachers and administrators in the effective use of media and equipment?
( ) c. How adequately do members of the staff keep teachers and administrators informed of the status of and the need for educational media services?
( ) d. How adequately do staff members help in the production of appropriate educational media?
( ) e. How adequately do members of the staff help students make effective use of education media?
( ) f. How effectively do students use the materials and facilities for leisure-time activities?[10]

The need for developing tools for evaluating school libraries or media programs was evident in a survey of school library leaders conducted by Mary Woodworth for the United States Department of Health, Education, and Welfare in 1967. In this survey, Woodworth found that 52 percent of the recipients indicated there was an absolute essential need for the development of evaluative tools.[11]

Sound evaluation is based upon criteria which is determined ahead of time. Let's discuss criteria for determining evaluative excellence in relationship to school library or media programs. First, evaluation should be based upon stated objectives. As indicated earlier school librarians have developed objectives or purposes which can be used to judge the program. In addition we have also seen that criteria has been developed to judge the school librarian and his or her competencies to perform the job needed in terms of behavioral objectives. More recently we have seen the beginning of the PPBS (Programming, Planning and Budgeting System) type of budget program begin to develop and be used as a method of evaluating the program in terms of specific goals in a specific situation.

Second, evaluation needs to be a continuous process. This does not mean that the same evaluation needs to be done year after year but that a program for total evaluation should be carried on over a reasonable length of time. This is especially true because schools make changes in their program which then need to be reflected in the library programs. Thus, it is essential that the program be evaluated continuously.

Third, evaluation needs to be comprehensive. In a school library or media program this is one of the most difficult things to do. It is easy to evaluate small sections of our program but in the past we have been almost completely unsuccessful in attempting to evaluate the total program results. When we attempt to evaluate comprehensively our ultimate question is how does the school library or media program affect the child or young person in his growth and development as an individual in our society. Instead we have evaluated using criteria such as how many books are circulated, how many students are in the library, how much materials is in the collection or how much money is budgeted for our program. Although these are an important part of a comprehensive evaluation they are only that--a part. Thus, a comprehensive evaluation has to include evaluation of the program goals and objectives.

Fourth, an evaluation needs to be a cooperative process involving many people. This tends to be more difficult than it sounds in the evaluative process. We must recognize the fact that the librarian needs to be the pivotal point or person in the process. This is necessary because the librarians are the people most qualified to understand what the program is attempting to accomplish. Others who may assist in the evaluation of the school library or media program include the faculty, the administration, the students and possibly the community. In suggesting these groups it is necessary to point out some possible pit falls andcaution that the involvement of these groups needs to be done in a way which will result in their expertise being useful to the evaluation process. For example, one of the most distressing things to find is that in a school that has a mediocre or poor program it is possible to find a faculty and administration that believe it is excellent. The reason for this is obvious. They have never been exposed to anything better. Maybe their past experiences have been programs that have been even poorer. Thus we cannot expect them to know the opportunities that an excellent program can offer to the instructional program. As a result, when the teachers and administrators are involved in the evaluative process it is essential that the librarian realize that their veiwpoints are based upon their own background and that their expertise is in terms of their own specialties and not that of libraries.

There is a recent example which will illustrate how unfortunate a study by unqualified persons can be. In Indiana a study was done of public schools by a group of businessmen. Theoretically they were instructed to look at the noninstructional part of the program and not to evaluate the instructional part of the program. Their goal of course was to find ways in which to save money. One of their recommendations, however, happened to involve elementary school libraries. Of course, the first question that should be asked is how can anyone say that school libraries are not a part of the instructional school program. Their basic recommendation was that a great deal of money could be saved if centralized elementary school libraries were eliminated. In some ways this conclusion is difficult to argue with as you can always save money by elimination educational programs in the short run. It must be remembered that the people who did this are not anti-school libraries but came to a conclusion based upon a lack of understanding of what is happening in elementary school libraries and what the purposes of elementary school libraries are. They have never seen the part it plays in the school's educational program. Thus, we have well meaning people involved in evaluation coming up with a recommendation that is definitely detrimental to school library development.

Although the above example is a negative one, involvement of many people in the evaluation process has a number of important pluses.

Teachers and administrators involved in the evaluation process tend to become strong supporters of the school library media program. They tend to understand better what the program is attempting to accomplish and the ways in which it can help them accomplish their own goals. The involvement of students probably would help them to understand the infinite ways in which these programs can assist them in their school work and everyday life situations. Thus, properly used the involvement of many people in the evaluation process results in increased understanding and use of the school library or media center.

Fifth, evaluation needs to identify strengths as well as weaknesses in the program. Frequently evaluation tends to emphasize the things that need to be improved and the things that are being done wrong and does not point out the many good things being done in the program. The value of emphasizing the strengths in the program is that these strong points can be used to build upon. It also provides encouragement to people working in the program and motivation for improving the total program. At times it is difficult to find many good points in a program. In the past frequently these have been superficial. However, a close look at any individual program should be able to identify some strengths, even if it is only that they recognize the need for improving their program.

Sixth, evaluation needs to include many instruments. Instruments used for evaluation of programs will be discussed in more detail later. However, it is important to recognize the use of a variety of instruments will give added depth to the evaluative process. The greatest difficulty in the present evaluative instruments is that they all tend to be of one type that involves counting and comparing against a set criteria. Although these instruments have an important usefulness in the evaluative process the use of additional measuring instruments will result in a better evaluation.

Seventh, evaluation needs to be based upon a knowledge of children and young people. Library education has not always recognized the needs of the school librarian and the unique training that results from working in a school situation. The Master of Library Science is a general degree which some would say qualifies the person in any type of library. Any practitioner realizes that this is not really true. To work successfully with children and young people in a school situation, additional knowledge is necessary. This knowledge involves children, adolescent psychology, learning theory and a number of other areas traditionally taught by schools of education. As a result the school librarian tends to be trained both as a librarian and as a teacher. One of the most difficult things to explain to a lay person is the difference between a librarian working with a young person in a school library and that of a librarian working with a young person in a public library. Indeed many of the practitioners themselves have difficulty in understanding the differences between these two branches of librarianship. Thus, the evaluative process needs to be based upon not only a knowledge of children and young people but an understanding of what or how the library program is supposed to accomplish for the young person.

Eight, evaluation needs to culminate in self-improvement. Evaluation which doesn't result in improved programs is a waste of time. It is far easier to criticize than it is to improve and to offer evaluations to do just that. A good evaluation needs to come up with strong recommendation which will improve the educational program or improve the library or media center situations. Improving means the program must result in better service to students and teachers. This also means that the recommendations must be practical and possible to implement. Although long range goals are desirable it is also necessary to include goals which can be obtained fairly quickly so that some satisfaction results and stimulates the desire for continued improvement. Evaluation should thus also include a means for eventual review to see if the improvements recommended have been made and if not why not. Follow up is an important part of this self-improvement and evaluative process.

Although the general topic in discussion is qualitative evaluation of school media programs, it is necessary to recognize that evaluation needs to be both quantitative and qualitative. There are a number of problems in evaluating school media programs. The most important is that most of the measurement instruments in school libraries up to this time have been quantitative and not qualitative. School librarians are very good at taking standards and saying that in a given situation a library should have 6,000books and that it only has 4,000 books or that the library should have five projectors and that it has five projectors or that it doesn't have five projectors.

Although we are good at judging quantitatively, when it comes to judging qualitatively we have had some difficulty Qualitatively is really where we get down to judging whether we are meeting the goals or the objectives of the library program.

A number of problems in evaluating school media programs were discussed by Frances Henne in her presentation to the Conference on Library Surveys held at Columbia University in 1965.[12] These will be used as a basis for discussing some of the other problems involved in evaluating school media programs. First, it is difficult, if not impossible, to evaluate a school library program separately from the evaluation of the instructional program of the school. In other words, if the main goal of the school library is to see that the curriculum objectives of the instructional program are carried out, how can we judge this unless we know what the curriculum objectives or classroom objectives are?

Another problem in evaluating school programs results from the fact that many of the elements of the school media programs do not lend themselves to precise measurement. Probably the things that are most important are the things that are most difficult to measure with precision. Although it is very precise to say that we circulate so many books, this is really meaningless as far as evaluation of how this influences the educational program. One study in a public library tried to determine how people used the materials they took home from the public library. They found out that books are not only used for reading. For example, one person went in and always got a fairly thick book so the children can use it to sit on at the table. The most important elements to be evaluted are probably ones for which we have the least precise instruments of measurement.

Because schools, curriculums and students are constantly changing, an evaluation instrument that might be useful one year may have limited value for the next year because of the changes in the actual school program. In talking to first year school librarians many of them say that one of the things that shocks them most is how the school program today is so different from their own experiences, even though they graduated from high school only four years earlier. They couldn't understand how schools having coke machines and candy bars fit into what they were attempting to accomplish. As students are given more freedom, such as in a school in which children are allowed to go home or anywhere they want to when they do not have classes, you might find that you have an entirely different youth than in a school library program or media center in which they are forced to go to study hall. In the latter case the reason they go to the library may be that it is better than the study hall because they can talk in the library.

Another problem in evaluation is that a great deal of statistics and other data about the program tends to be gathered but minimum time is spent in evaluating it and determining what it actually means. It always looks nice to use charts showing that the library has this number of volumes or that circulation has increased by such a percentage, but as far as interpreting how the data relates to the school program little is done or it is lacking altogether. It is extremely important that these statistics and how they influence our objectives be evaluated and interpreted.

Because school programs vary from year to year and from school to school it is very difficult to make any comprehensive study that can be applied to any other situation or even to the same situation in a different year. A new teacher is hired and recommends that the media center purchase all sorts of materials in an area which they have a special interest. After these materials are acquired the teacher moves to another school and the materials sit on the shelves receiving very limited use. This happens frequently in school libraries. The library prepares for one teacher and the next year has a differnet teacher that emphasizes different materials. As the emphasis in the instructional program changes then also the library collection and program have to change. The evaluation of goals and objectives has to involve some subjective appraisal. At some point somebody has to make a subjective decision as to whether or not something is happening, it can't all be done with precision.

Another problem in developing criteria to measure school media programs is that there are few or no school media programs that have a large enough staff, collection and facilities to serve as examples of the ideal. This is especially true in the area of staff. How many schools have large enough staff to offer what would be considered the optimum level of service? The Knapp Project demonstration school library may be an exception to the above generalization.

Using quantitative standards to evaluate may result in the continuation of an undesirable situation. Many high school libraries are evaluated by one of the regional accrediting associations. Their criteria is often geared to the lowest common denominator. Thus, their standards are so very low that the worst school has to be able to meet their standards.

Evaluating education is really very difficult to do. It is possible to evaluate whether students learn to read but so far it hasn't been possible to evaluate whether or not three years form now, unless something else is done, they will continue to read better. One of the most distressing research projects involving reading was a study of library summer reading programs. Children who read during the summer would come back to school in the fall and be better readers than the children who didn't go through this program. What was found was that they were better readers in the fall, but when you got to December or January the other students who hadn't been involved in this reading program had caught up to them.

How are or should goals for school media programs be evaluated? In the past three things have been done. One, there have been quantitative studies in which a school media program is said to either have or not have so many of something. This is all based upon the assumption that if everything you needed for learning is available, then learning is going to take place. Although in such a situation learning may take place. The assumption that it is going to automatically may be questioned. Just because the materials, staff and equipment are available does not mean that they are going to be effectively used.

An improvement over that type of evaluation in school media programs was the development of what might be called the check list approach. In this type of evaluation a subjective statement is made and people then indicate whether or not the situation discribed is present. For example, starting with the assumption that students who use the library become skillful in the use of printed, and/or audiovisual material, a question might be asked, "Do the students use the library?" This could be answered yes or no. Eventually the measurement was refined so that the teacher could say that the school media program should be doing this or that they shouldn't be doing this and then indicate whether they thought that the library was doing it.

Probably the most comprehensive and the one in which most of the other evaluations of this type developed from is the evaluation criteria of all the accrediting associations. Formats of these are used by the various evaluation agencies in this country.

The third type of evaluation of school media programs are the comparison type studies. In these controlled groups are used. For example, one control group may be in a school that doesn't have a library situation. An attempt is then made to see whether there is a significant difference between them based upon the availability of the library. Originally these were used to measure skills, such as library skills. Later on more difficult things, such as amount and quality of reading and the purposes and interests of reading in schools where they had school libraries and where they didn't have school libraries, were measured. So this type of comparison seems to have great validity and is useful in showing whether or not the library program is fulfilling a function in the education process.

Another way in which the success of a library of media program can be evaluated is by evaluating actual knowledge acquired by students. In doing this tests such as the Iowa test of basic skills or other basic skills tests can measure whether or not students have learned factual matter. If this is one of the objectives of the school then this type of measurement can be used.

In conclusion, it can be said that it is necessary to get away from the former method of trying to evaluate by evaluating what there is in the library and instead try to evaluate what the library does for or to people. In the process of doing this it is important to realize the library itself is just a means to an end, and not an end product itself. When the student comes into the library or media center he or she has a need. When he or she leaves the need may or may not be filled. If it is, the media program can be considered successful, if not the program may be considered unsuccessful. In evaluating media programs the probability of success or lack of success in fulfilling his or her needs is what really needs to be evaluated.

FOOTNOTES

1. William H. Allen, "Audio Visual Communication," *Encyclopedia of Educational Research,* 3rd ed., p. 115

2. Frances Henne, "School Libraries," *Encyclopedia of Educational Research,* rev. ed., p. 701.

3. American Library Association, Committee on Post-War Planning, *School Libraries for Today and Tomorrow,* (Chicago: American Library Association 1945), pp. 9-10.

4. American Association of School Librarians, *Standards for School Library Programs,* (Chicago: American Library Association, 1960), pp. 8-9.

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6. *School Library Manpower Project Phase I--Final Report to the Knapp Foundation of North Carolina, Inc. and the American Association of School Librarians,* (Chicago: American Library Association, 1970), pp. 37-52.

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10. National Study of Secondary School Evaluation, *Evaluation Criteria,* Washington, D. C., National Study of Secondary School Evaluation, 1969 pp. 287-88.

11. Mary L. Woodworth, *The Identification and Examination of Needed Research in School Librarianship,* (Madison, University of Wisconsin, 1967), p. 222.

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QUANTIFICATION OF LIBRARY VALUES FROM THE USER'S STANDPOINT

Choong Han Kim

In the previous papers, input and output quantification problems have been discussed largely from the national, state, institutional and professional standpoints. In this paper, the problems are discussed from the patron's standpoint. The assumption here is that the library must account for its service output to justify its existence. In a way, this paper is an attempt to define the library's accountability to its constituency. This means that the librarina should find a way to quantify the service outcome at the user's end.

When developing curricula, educatiors determine what is best for the learner. However, it is not for the library or librarian to determine what is good for the patron. If librarians are to determine what services are best for the community, they should do it in collaboration with the recipients of the service or with the library constituency. It is somewhat like medical professionals whose service is determined largely by the patient' medical problems and the state of medical art. Likewise, library service objectives and service activities should be determined by the patron's problems and his ability and the state of library art. With other numerous institutions and organizations, the library has a shared responsibility of education, information and research; the question is how large a share of responsibility or how important a part the library has in the total contribution. In order to help answer this question, it is very important to know and account for what happens at the receiving end of library service.

In this discussion, the usefulness and the feasibility of providing for standard classification of library goals and objectives will be studied. Usefulness of such classification is obvious, for biologists have found their taxonomy very helpful as a means of accurate communication and understanding in biological studies. Recently in education, development of taxonomy of educational objectives (in behavioral terms) has been found very useful in providing teachers and educators with common grounds to develop curricula and evaluate instructional effort and student learning with more precision than hitherto possible. Obviously the librarian will benefit by the same kind of effort, since he is interested as much as educators are in evaluation of one's performance.

It seems to this writer that there are two general dimensions to quantification of library service outcomes: one is in terms of material (or economic, if you will) outcome to the user and another in terms of intellectual outcome. To the patron, values of library service are (1) in terms of whether or not he has found the material he wanted to use or the material that met his requirement, and how successful he has been in finding such materials in the library; and (2) in terms of intellectual gain as the result of library use by the user. These are discussed in two parts starting with the material dimension.

MATERIAL (OR ECONOMIC) DIMENSION

Traditionally the library has evolved as a storehouse of educational or reading materials and valued as such by the public and the library service as a distribution and dissemination function of these materials. The library is a storehouse today and its service still is material distribution service. The library and the library services do not and cannot escape public evaluation by economic principles.

One obvious value of the library to the user is purely economic, that is, the money value of the material that the user would have paid for rental purposes or ownership; the value of the library service, however, would be in terms of the value to the user of time and effort that would have been necessary if the material were to be found and located by the user himself without the library help. In this discussion, we do not go into the argument that the library should have a credit for what is inside the material and its influence on the user. This is in line with the traditional attitude of the library profession that the library is not responsible for what is inside the material. Whether the library had inspired another Einstein or Karl Marx is purely by rare accident.

The library value to the user is of two kinds: potential and actual. The potential value is meaningful only to the extent that the user is capable of benefitting from it. One cannot weigh the potential value until it is proven by actual use outcome. This writer, therefore, takes the position that the library services should be evaluated on the basis of actual use rather than assumed value.

The material dimension is discussed in terms of (1) library's document delivery capability, and (2) patron's library use activities--amount and kind. An attempt will be made to identify and discuss some of the major material-variables and library-use variables. This discussion doen not concern who the individual users are or the whys of their use.

1. Library's Document Delivery Capability.[1]

The library's service capability is basically an input index or a potential of service. Capability by itself does not produce service, but it does influence as determinants the service outcome.

What capability does is indicate how easy or how difficult it is for individual patrons to find or obtain materials or items of information from the library catalogs, from the library collections, or from other libraries or branches. It is not only the library's capability but the patron's capability as well. These capabilities can be expressed in quantitative terms, such as how well stocked the collections are, how often patrons fail to find or locate materials they want, how much time and effort are necessary for patrons to use various library services and so forth.

The potential value of the library service to the user is determined partly by his or her experience with the library service either at a particular library or the library in general. The library capability indicates to the user what probability of success he or she has on the next library use venture. The library use requires some effort and time on the part of the user; so he is unlikely to pay the price or make such an investment unless he sees a reasonable chance of success in the library.

1-1 Relevancy of a given subject collection to a given community or group.

Library collection represents the single most important investment, and obviously the value of the collection is directly related to the relevancy of the collection to the constituent community or users.

The relevancy is measurable in terms of actual use of the collection by patrons. The relevancy is a function of given objectives and also of a given period of time. A collection currently relevant may not be so for the next century or even next decade. However, we can certainly say that the greater the use, the more certain of relevancy. The opposite is also true--the greater the relevancy, the greaterthe probability of use.

Some librarian believes in great intrinsic value in a great collection itself regardless of actual use made from it. Its relevancy increases as its time and community perspective widens. The above view is probably more valid from the long-term national standpoint than from a short-term local standpoint, inasmuch as whatever the subject, it would probably be more relevant to the nation-wide (or even world-wide) patrons than to the few local patrons.

A local library must (usually) justify itself within the context of local parent institution or community requirement on a short-term basis. The great bulk of the local library collection is to satisfy the short-term current local requirement. The great bulk of use is usually accounted for by a small part of a collection. For example, 50 percent of use is accounted for by less than 50 percent of the collection. The more even distribution of use, the more relevant is the collection. Thus not only the total amount of use, but the distribution of use is an indication of relevancy. It is obviously important for all the patrons that no minority group is granted special privileges to the limited resources.

1-2 Up-to-dateness of a given subject collection.

Being up to date in one's special field or in any subject that one happens to be seriously interested in at a given moment (everyone experiences this urge or necessity to know the latest information or material quite frequently) is a very desirable goal for anyone. It is probably more so for those professionals and scholars whose job requires a sustained access to the most up to date collection. Why the library? Because the library is the most logical place for people to expect a reliable collection or source of the very latest published materials or information. It is, therefore, a very desirable goal to make new materials available for public use as soon as possible.

Loud laments are heard about the long delay in library technical processing that keeps a big backlog. The length of delay should by all means be minimized. Library technical processing staff usually have no or little direct concern for instant availability of materials newly acquired for public use, for most of the materials are cataloged for permanent collection. Not seeing the direct result of library service at the receiving end, these technical processing staff are more concerned about the technical matters, such as accurate and correct procedures, than the ultimate end of the library service.

Simplification and streamlining of work flow and procedures are essential in making the material available for public use as soon as they are acquired. Preparation for automation usually helps analyze the problem and helps solve the problem without instituting of automation.[2] In many libraries today, "fastcat" approach is being tried, which allows the new materials to circulate as soon as they are acquired while the paperwork and catalog making are carried out without holding up the materials in the processing room.[3] These are necessary efforts to expedite the acquisition and technical processing and thereby increase the library's document delivery capability.

A measure of up-to-dateness, therefore, should be in terms of length of time-lapse between the moment a book is made available in the market and the moment the book is put out in the library for public use. The delivery capability in terms of minutes, hours, days, or weeks, makes a crucial difference in making a user want to use a particuular library service at a particulat time. Much of potential library use is lost because of delays in making the material available, especially the new materials acquired by the library.

1-3 Completeness of a given subject collection

The human mental process is such that one makes calculated decisions (in most cases it is reflexive) based on all available choices or reasonably complete choices. Especeally in creating a new knowledge, one must know all the existing knowledge in a given area. This is specially true for professionals whose job requires high level intellectual effort, such as research and/or writing. It is of paramount importance that these people have an access to a complete assembly of research materials in a given subject area.

The completeness of a subject collection in the library is a library-generated benefit inasmuch as the collection is the result of library effort, without which patrons must depend on their own means to obtain what they need (if they know what they need) and take chance in making decision or judgment on the basis of limited choices or knowledge. The complete collection exerts a kind of synergic effect on the user in that a creative mind gets a powerful suggestion as to new ideas, possibilities, hypotheses, models, from the observational and descriptive materials.

Without these collections, man's creative effort and even regenerative effort will be critically affected, for a society or a nation must rely on individual's limited memory or limited storage capacity and on individuals goodwill for its own survival, let alone its own improvement. The library collection, in the final analysis, represents a nation's (or civilizations') intellectual and cultural capital formation. It is incumbent on librarians to maintain the collection complete and up-to-date and to make sure that the intellectual capital is making an effective and handsome profit. The intellectual capital can and should be improved, of course, by weeding out redundant and trivial materials and by summarizing or synthesizing them in some way. This belongs to intellectual contribution of librarianship and will be discussed in the second part of this paper.

The measures of completeness could be (1) in terms of absolute number of items in the collection or collections, and (2) in terms of ratio of number of items in a collection to that of an ideal collection. The ideal collection is, of course, relative to the criteria set up for a given discipline or topic for a given point of time. This could be a fascinating subject for library science research.

The ideal collection is fraught with difficulties in defining it. It is somewhat like defining the standard of living on material basis or defining the total economic dimension. It is relative and evolving, but it gives a definable basis for possibilities and options for the basically unpredictable future. For the present with a given user with given ability, it can serve as a qualifier. In other words, if a collection is half as complete as may be desirable, the use-outcome from that collection would be half as satisfactory as that from the complete collection.

1-4 User's success (or failure) rate of finding specific documents (or items of information) in the library collection.

This is not only the library's problem but also user's ability in using the collection and/or the library. But with a given ability and familiarity of a user with the library, the user success or failure depends on one of the following situations:

1-4-1 Document not in the collection (assuming no substitutability)

Document is obtainable only through inter-library loan or special trip to the library (branch, departmental libraries or library of different jurisdiction)

1-4-2 Document being used or checked out in circulation.

- -1 Checked out of the library
- -2 On inter-library loan
- -3 Being used in the library

1-4-3 Document waiting to be shelved to its place

1-4-4 Document on order

- -1 In acquisition process (Document not arrived)
- -2 Document arrived but in technical processing
- -3 Document being bound or in the bindery
- -4 Document being recataloged or relocated

1-4-5 Document missing

- -1 Misshelved
- -2 Missing unaccountable (including theft)

How often patrons have succeeded (or failed) in finding specific document or information they wanted in the library is a good indication of the library's document delivery capability. Mr. Schofield's paper in this volume specifically deals with this problem.[4] The more successful the users are, the more capable the library is. It follows that the more successful the user's experience with a certain collection or service, the more use will be made of that collection or service. Similarly, the more failure, the less use.

The user satisfaction with the library and its service is a function of user expectation. There is an inverse relationship in that the more user expectation, the more dissatisfaction. The user expectation is again a function of the library promises in that the larger the promises the more expectation. This is reflected in their high sounding rhetoric, and the problem is they become firm believers in their own rhetoric. This brings about unhappiness over the large gap between the promise and the reality.

Solutions to the situations indicated by the 1.41's and 1.42's could be found in several alternatives: 1) to borrow from other libraries, 2) send for a photocopy, 3) send an order for the document to acquire, 4) send the requester to the library where the document is (make sure that the document is reserved). For the librarians, the course of action depends not only on the likelihood of the document being wanted again in the future but on the relative cost of each alternative. As far as users are concerned, the quicker the delivery of document, the better.

As far as patrons are concerned, it is very desirable that the library procures adequate number of duplicate copies of documents in demand. To increase the DDC (Document Delivery Capability), some suggested that at least one copy of all the documents in the collection remain in the library at all times and that only duplicate copies be allowed to circulate outside the library.[5] Other solution is to increase the turn-over rate of documents being circulated in and outside the library by making the loan period various with the kind of documents and the kind of use. A successful experiment has been made in England in support of this.[6] An extreme case is the reserve book collection. The queueing theory can be used to help figure out the length of queue and the number of duplicate copies needed in order to reduce the queue. It can be computed for each individual document or a class of documents.[7]

Situation indicated by the 1-4-3 calls for a different solution. Frequent and efficient reshelving and shelf-reading are essential. It is a very specific operational objective that the documents be returned to the proper places after each use as soon as practicable, and at the same time each use (whether in browsing or on the table) be accounted for by some simple means. The latter is of utmost importance in library output accounting, as most librarians do not count the inside-the-library use, which is, in fact, more important to the library than the outside-the-library use.

Situations indicated by the 1-4-4's require a solution that assures not only a fast and economical technical processing but also fast or instant availability of new documents for public use in the library as soon as they are published and out in the market. In many libraries some form of "Fast Cat" approach is in use to reduce the long cataloging delay of newly acquired documents.[8] It is demonstrated that the technical processing and cataloging can be done without the materials being held up in the processing room. Some sort of temporary catalog can serve for the interim period.

Situations indicated by the 1-4-5's can turn the library into a really bad case of arteriosclerosis. A simple technology can be developed to make the continuous shelf-reading and inventory taking as well as use-accounting practicable. Such a simple system of call-number labelling could be improved to allow for some sort of automatic scanning to spot missing and misshelved items as well as taking inventory of items on the shelves.

One could use the four measures thus far discussed either singly or in combination depending on the purpose of evaluation. If one is developing a national research collection on a certain subject, the most important measure would be that of up-to-dateness and completeness. If it is an undergraduate college library collection, emphasis will be placed on the measure of relevancy and document delivery capability as measured by the user success (or failure) rate at the shelves.

As previously mentioned, the document delivery capability with the four measures does not by itself produce library use, but it does affect the outcome of the use. In other words, it affects the degree of success with the library use. Past experience of success with the library use will encourage further library use, while experience of frequent failure will certainly discourage library use. In other words, it affects the library credibility. Thus the DDC has to be one that is demonstrated and not one that is merely assumed or wished for.

2. Patron's library use activities and amount of time and effort expended for these activities.

As far as users are concerned, all the library use activities are necessary effort in order to obtain the desired outcomes. No attempt here is made to make value judgment of outcomes. Whatever the outcome, it is counted as productive so long as it is satisfactory to the user.

Borrowing heavily from economics, some concepts are useful in this discussion of library use. A library service is produced when there is a library use. The more use made, the more service produced. The value of library use has to be determined by the price the buyers pay. The value of library use is determinable by the amount of patron's expenditure of time and effort in doing certain library-use activities. In other words, the latter is the equivalent of price the patrons pay.

Undoubtedly some of these activities are unproductive or partially productive and inefficient owing not only to the user's own limitations, such as insufficient subject knowledge and/or unfamiliarity with the library organization, but to the library's limited potentials or document delivery capability. To obtain a desired outcome, it takes more time and effort to use a low DDC library than it takes to use a high DDC library. Likewise, an unskilled user takes more time and effort than a skilled one to obtain the same outcome. Thus we have recognized two major factors, the library's DDC and the user ability, which determine the amount of library-use activities. The latter may be termed as Library Use for Desired Outcome or simply Ludo.

There is no way, as far as this writer knows, to count only the productive library use or use activities. As mentioned earlier, all the activities have to be regarded as necessary evil. Our main interest is how to increase the prodcutivity of library use.

Document Exposure (hereafter called DE) as a measure of library use has been proposed by Hamburg and his associates.[9] The DE measure is comprised of DE count, DE hour, and DE day. A unit of DE is a unit output quantity of document use. We are not going into a discussion of this measure, but it should be pointed out that DE measure does not distinguish between productive and unproductive library use. One can count a lot of DE with little or no satisfactory outcome if the library is a bad one or the user is unskilled.

The next question is how to increase the productivity of library use and how do we know about productivity increase or decrease. We are not making any value judgment of whether or not two uses are better than one use or two-minute use is better than one-minute use. We are interested in only the amount of use in terms of frequency, time and effort. With a given amount of time at hand, the patron may have several options; one can use all available time entirely for one kind of activity or one can divide the available time among several differnet activities. The more one can do with the given time, the more productive of library use. So, if the library is interested in increasing the productivity of library use by the users, it should find a way to monitor and account for kind of library use and frequency and amount of time expended on each use.

What are these choices or options that the users are supposed to have in their library use. First, we have to make a list of all these different activities and to try to find meaningful groupings that really make distinction between alternatives or choices that users have. We may call this list a taxonomy of activities or alternatives. The taxonomy is a sort of shopping list of library use activities for the users.

In making the shopping list of user's alternatives, we have to presume key variables that influence the user's choice of alternatives. In other words, what makes users go to reserve collection or to stack collection and so forth. Most important independent variable is obviously amount of time the user has in completing the given task in or with the library. The dependent variable is amount of use expressed in terms of DE or equivalent measure of output, obviously because of the fact that we are dealing with material dimension of library service. The dynamic interrelationship between these two variables has to be borne out by experiments and testing of empirical data.

Since we have no exact definition of user's time variable, our calibration of time is admittedly crude. The time grouping is meaningful only when it is related to the kind of task users have. In school and academic communities, user tasks have definable time limits or deadlines. In public libraries, however, most of the tasks are longer term. Thus, first short-term grouping could be from few minutes, hours, to weekend or several days not exceeding a week; the second grouping could be for inter-mediate term tasks in terms of weeks; the third grouping could be for long-term task (such as for a semester) in terms of months; the fourth and last grouping could be for semi-permanent or life-time task or interest in terms of years.

The taxonomy or shopping list of library use activities grouped according to time-interval of various tasks could be worked out as follows: (This is by no means a complete or final plan--different groupings are quite possible)

2-2 Short-term tasks in terms of DE minutes, hours, days:

  -3 Use of reserve collection and reserve reading room
  -4 Use of bibliographies, indexes, abstracts, card catalogs, etc.
  -5 Use of ready-reference collection
  -6 Use of vertical file collection
  -7 Use of audio-visual materials including direct dial access

  -9 Use of xeroxing short articles for immediate use (home work)

2-3 Intermediate-term tasks in terms of 1-4 weeks

  -3 Use of subject collection in stacks including browsing (microforms)
  -4 Checking out materials to carrels
  -5 Checking out materials to homes and dormitories

  -8 Checking out materials by mail
  -9 Xeroxing materials for home work

2-4 Long-term projects in terms of 1-12 months

  -3 Use of subject collection in all areas or locations
  -4 Use of materials in microforms or in special collection
  -5 Checking out materials to carrels or homes
  -6 Use of browsing (extracurricula) collection
  -7 Borrowing materials through inter-library loan (including photocopy)

- -8 Checking out materials by mail
- -9 Xeroxing materials for own home collection
- -10 Use of own materials

2-5 Semi-permanent or life-time project or interest in terms of years

- -10 Use of own materials in the library including rental textbooks

It could be established easily that the cost of serving the shorter term project is higher than serving the longer term project. An immediate implication is that the library should try to help users make their tasks a longer term project and help them schedule their library use in advance so that both the library and the user can have an adequate lead time.

Operations research methods could be used to study the library use. Professor Morse of M.I.T. has shown in his book that this could be done.[10] He suggested a number of probablity distribution curves (or models) that indicate how many users are expected to be in the library at a given moment and how long they stay, and how many would be doing certain activities at each library visit. These models could be just as well adapted for the above groupings of library use activities.

INTELLECTUAL DIMENSIONS

In the preceeding discussion of the materials dimensions of library services, the library use outcome is treated as value neutral. The underlying assumption was that one outcome satisfactory to one user is as valuable as another outcome that is satisfactory to another user. This assumption holds good so long as the library service is limited to providing or circulating materials. Library professionals, however, do not accept this restrictive view of their role. There is another dimension in the library service which needs to be studied:librarians usually like to assume much larger roles than providing and circulating materials.

It is largely an intellectual dimension. If the economic dimension is mainly about the quantity of library use, intellectual dimension should be about the quality of such outcome. In the former, materials and time were central. But in the latter, what the library staff does is of primary importance. In this section, we separate intellectual service as distinctive from the materials service. It is defined as:

> The library-generated guidance given to users in order for them to improve the quality of their library use outcomes. Such a guidance should be of highly intellectual content which requires learned expert judgment and authority on the part of the professionals who provide such guidance. And the intellectual guidance could be in various forms, some of which require extensive user contact and others require only a minimal personal contact with the users. Whether or not there is a personal contact, the intellectual guidance must be of library generated whether it is a local or a national library. It also should result in better quality library use outcome than if there were no guidance provided.

Thus it is important how staff time is used. Lacking meaningful professional output measure, no professional can be sure of how to evaluate the effectiveness of one's role. We do not know how to avoid doing things perfectly or efficiently that need not be done at all. If 50-70 percent of the library budget goes for wages and salaries, it behooves the library to examine carefully what staff are doing. Raffel and Shisko's study of M.I.T. libraries indicates how much budget is going to staff work in the technical processing.[11] Using the same data in the book, it can easily be computed that only about 14 percent of the budget goes to staff work in direct service to the public. It behooves us to decide whether this percentage balance is right or too little or too much.

A distinction should be made between professional and supportive staff service. The latter is valuable and necessary and it can speed up the library use greatly, but it does not contribute directly toward improvement of quality of library use outcome. For instance, a clerical assistant cannot give much intellectual help to a professor who is looking for an elusive citation that he needs for his research paper. Evaluation of professional service in libraries is not unlike that of the medical profession, for both evaluate the quality of service outcomes and not the quanity of how many patients or clients one can treat per day. But we do not know how to evaluate the quality of a library professional's intellectual service. Library professionals should not be rated on the basis of productivity in terms of book circulation or document exposure per dollar input. It seems to this writer that Hamburg's study and many other similar studies failed or avoided accounting for intellectual dimensions of library service which is really what the library services are about. It may be maintained that document exposure or library book circulation is but a small and superficial part of what's really involved in the library's intellectual service.

Inasmuch as the medical service outcome is evaluated not on the basis of number of patients treated or of staff activities, but on the basis of difficulty of the medical problem and treatment required, the same should apply to the library staff's intellectual services. In the latter case, we have to distinguish the level of intellectual sophistication that is required in giving intellectual guidance. If it is a medical problem, it will be whether it needs a specialist or not. In the same way, the library users' library problem should determine the kind of staff and intellectual sophistication required. It is important, therefore, that one makes a catalog or taxonomy of definable library problems that users bring into the library. Books are intellectual products, and people come to the library to consult these intellectual products to solve their problems which are largely intellectual ones that require library assistance (1) in searching for specific knowledge or information, (2) in learning of specific extant knowledge, and (3) in creating new knowledge. These are in a sequence that requires progressively more demanding intellectual effort and capacity. In other words, creation of new knowledge is far more difficult and demanding an intellectual process than learning of existing knowledge, and the latter is, in turn, more demanding a process than a simple locating process of specific item of knowledge or information which the seeker knows how to use in solving the problem.

An attempt is made in the following to develop a catalog or taxonomy of user's library problems in an outline form, and after which follows the discussion of what ready-made intellectual guidance may be provided by the professionals as well as discussion of active guidance for problem solving by staff communication and contact with the users. Thus the library's intellectual service is comprised of three aspects: (1) identification of user problems, (2) make-ready organization by the professionals, and (3) direct contact and communication with users by the professional staff. These are somewhat like a medical diagnosis, treatment and prognistic arts and actual treatment. These processes are done at the same time.

3. Taxonomy of library problems or library use purposes.

These problems or purposes are somewhat remotely related to the user tasks as discussed in the previous section about library use activities.

3-1 The problem here is searching for specific item(s) of knowledge or information--which include factual or descriptive accounts or data, illustrations, models, processes and technical knowhow. The user is supposed to know exactly what it is that he seeks and how to apply and use it. These user problems may be divided into four sub-problems or purposes.

-1 Looking for particular item(s) of knowledge or information. This could be one particular book or article, report, table, chart or illustration and/or design.

-2 Choosing from a group of acceptable items or data. Any one item is as acceptable as any other from the group of choices.

-3 Choosing only the latest or newest or the best choice from a group of choices given.

-4 Seeking the total and complete array of all available or all pertinent choices in a specific topic or subject area given.

These are in sequence requiring progressively more demanding intellectual effort and capacity. Seeking a complete array of all pertinent items requires a comprehensive knowledge of what is pertinent and available, and this is obviously more demanding than seeking an isolated item or items of information. This sequence is by no means complete nor perfectly objective; this is a hypothetical arrangement which may or may not have any implication or bearing on either intellectual organization or staff guidance and contact.

3-2 Learning of a given knowledge. The problem here is learning a given existing knowledge. The learning includes both formal and informal, and it includes only the purposeful learning as distinguished from the incidental learning. One exception is children's learning in which purposeful and incidental learning cannot be separated meaningfully. In the following are delineated four broad levels of learning processes. This is a working hypothesis:

-1 Learning of a given operation or application; learning of skills in practical application of a certain knowledge or information; learning to appreciate or know the practical implication or usefulness of the given knowledge or information. In learning of arithmetic, for example, one can learn the techniques and the hows and its practical application without knowing the full proof or rigorous logical understanding. On any level of intellectual capability, one can appreciate the usefulness and practical application of a tool, machine, lists, dictionaries, handbooks or manuals, or any programmed learning materials without fully understanding the underlying or background science or engineering that is involved in it, and can learn to operate and use it. Concrete learning comes before abstract learning. In other words, abstract can only be built on a concrete experience.

-2 Learning of the observational facts and descriptive details of a given knowledge. One learns a good deal of observed factual details about a subject before one can organize them into a sort of abstract system or concept and draw a conclusion. This process is more demanding intellectually than the learning of operation.

-3 Learning of the structure of a given knowledge. The concrete knowledge or experience is organized into an abstract, conceptual system or structure, beginning with a crude one and gradually developing it into a more refined structure or concept. This requires more effort and capacity than that required for learning the descriptive factual details.

-4 Learning of the functional working of the whole and the inter-relationships between various component parts of the given knowledge. If the anatomy provides the structural knowledge of an animal, physiology provides the functional knowledge of the body. Both not only describe what it is like but explain the whys. Being able to explain requires more comprehensive and deeper knowledge than being able to describe.

-5 Learning of the limitation of a given knowledge and its boundaries; learning of interrelationship with other related knowledge; learning to apply one knowledge to other or transfer one model to other situations.

When one reaches this stage, there is no more to learn about the given knowledge. The next stage is creating a new knowledge or expanding the boundaries of the given knowledge.

3-3 Creation of new knowledge, which includes literary and artistic creation, such as creation of original ideas, theories, new interpretations or insights, original literary or artistic work. Creative process requires intellectual faculty and effort of the highest order. It requires the creator's utmost effort and ability.

User of libraries for research purposes is probably the most library dependent patron. Conversely, the research service or the service designed to help original research requires the highest capability on the part of the librarian who provides it. The user's research problems may be divided into seven levels:

3-3 Creation of new knowledge

-1 Research problem formulation and definition. This requires knowing a) who has done what research, and b) who is doing what research or what is current in a given area.

-2 Formulation and definition of working hypothesis. This could be in two sub-catagories:

-1 Knowing all alternative hypotheses
-2 Organizating these hypotheses into a sort of system

-3 Formulation of required data. This requires knowing all usuable data samples which could be classified by types, such as:

-1 Verbal data or descriptive data (Including graphic data)
-2 Statistical data (normative, criterion)
-3 Mathematical models, equations

-4 Experimental design or study design or model. This could be classified by types of the study and research models. Various scientific disciplines use various designs and models. This includes research procedures commonly followed.

-5 Collection and evaluation of required data. This includes data collection and evaluation methods. (Validity of the data included)

-6 Organization of data for interpretation. For example, computer program models, statistical analysis models, documentary analysis models, mathematical models, etc.

-7 Research report writing; literary writing. For example, writing abstracts, styles and formats, etc.

4. Library's ready-made organization providing intellectual guidance.

If one should develop a taxonomy of library use purposes or problems, one should also develop a similar taxonomic enumeration concerning the library's intellectual organization of knowledge and information, subject by subject, and level by level. Similar to the medical art which developed different treatments for different diseases, the library's intellectual organization should be developed problem by problem. Such an organization should help not only those who know what to look for but also those need to formulate the questions before answers are sought. The library's traditional classification systems or many thousands of subject headings or terms are designed to help the former rather than the latter. So far the main emphasis has been placed on storage and retrieval of specifically defined items of documents or information materials to help those who have formulated the question already. When it comes to helping those who need to organize themselves, the library organization is very little helpful.

We have now a few primitive intellectual organizations or systems to help users who are expected to be able to formulate and articulate their problems in terms of specific items of documents or information. In other words, our present organization is geared to serve those who have worked out their problems and tasks in terms of specific documents and information that they are going to use. We just began to see that the library users often do this on a haphazard basis, that is, trial and error basis. We began also to see that more often than not, users do formulate and define their problems based on what they find in the library. We do not have any system to help these processes.

It is altruistic to say that the most important and increasing value of the library service is intellectual and its capability of instant recall of organized information and knowledge required on various levels of problems or tasks. The library-produced organization of intellectual products is itself an intellectual product and it represents the library's capability of intellectual assistance or guidance to the users. The more sophisticated the level of intellectual organization, the more capable of sophisticated assistance. People of various intellectual capability and background come to the library for an intellectual assistance that will help them get their thought organized and their insight formed whether their problem is research, education, or a simple search for an item of information or document. So, the library's intellectual capability is directly related to the degree of sophistication of intellectual organization ready made or provided on demand by library staff.

The library could be likened to a giant information storage and retrieval system, as it stores and sorts out pertinent information and knowledge to help users get organized, learned, and inspired. It can be maintained, therefore, that the library generated intellectual organization should follow very closely not so much the subject matter but the way human thoughts are formed, the way a human learns, and the way human intellect works to create new thoughts and new insights. The closer we get to knowing these human thought processes, the more pertinent and more effective can the library organization be made. Although our present knowledge of human thought and learning processes is meager, we have to develop some workable model along these lines. Our discussion here is about future organization that should be developed to deal with the more sophisticated, high intellectual problems of library users. What we have today merely serves the beginning level problems or purposes.

The following classification attempts to enumerate the sophistication levels of the library's intellectual organization that can be seen today.

4-1 Level of intellectual organization

Produced by the library

-2 Local library classification for shelf-arrangement
-3 Local library subject catalog (card or book catalog)
-4 Local library author-title catalog
-5 Model library shelf-lists or standard catalogs

-7 National union or universal catalogs; national and trade bibliographies
-8 Subject index to periodical literatures
-9 Subject bibliographies, including bibliographic index
-10 Bibliographic guides to subject literature, including library guides
-11 Abstracts
-12 Current book reviews

-14 Home made information file at local libraries

-16 Computer data base for instant retrieval

Produced by the private and public publishers

-21 Encyclopedia, handbooks, dictionaries, etc.
-22 Textbook materials with course related reading lists or bibliographies, including audiovisual instructional materials
-23 Observational, descriptive literature of all forms and formats
-24 Theoretical, philosophical, research literature

These are ready-made library-produced intellectual organization that are seen today, and these by no means exhaust all the possibilities in the future. It is not inconceivable that in the near future, highly sophisticated computer technology might come to assist the library's intellectual task.

So far we have been discussing the library's ready-made organization. Largely untouched and unexplored area of direct-contact personal service and communication starts from where the ready-made intellectual service ends. Somewhere along the line the professional staff must assume responsibility and authority in making independent, expert judgment in serving the constituent individual users and communities by direct personal contact and service communication. The librarian's responsibility does not end with mere provision of material collections. His main responsibility, therefore, is to make sure that the library is serving all the constituent users fully. This is discussed in the following part.

5. Personal service through direct contact and communication.

If the term "passive" or "indirect" service applies to the library's make-ready intellectual organization function (such as selecting, acquisitioning, classification and cataloging, indexing, abstract making, etc.), a contrasting term "active" or "direct" service will apply to a host of "patron contact activities" of professional staff. The latter is the subject of this discussion. The term "patron contact" may be substituted for by another term "professional relations" to mean that the contact does not only mean person to person and face to face contact but also communication contact with individual users, such as telephone, mail or announcement through newspapers or radio. The following taxonomy of these personal service contact and communications is an attempt to delineate such relation in a meaningful order. The professional relations and contacts between the library staff and individual users are arranged in the order of increasing commitment.

The professional staff's task analysis is meaningful only when the results of staff activities can be accounted for and evaluated. In medicine, medical doctors can and must diagnose and treat the patient directly and personally and the result of treatment can be readily evaluated directly. Ideally the same should be attempted in the library staff's direct assistance or guidance. In other words, the library staff work should be accounted for in terms of assistance to the user that can only be given by direct staff contact. Within the given amount of staff time, the more staff assistance given to more people, the more staff output obtained. For example, the reference staff can do much more if they were saved from having to answer the so-called directional questions that comprise more than half of all the questions.

Library uses are of two kinds: self-served use and staff assisted use. Our problem here is to find a meaningful measure to account for both library use outputs--counting DE or similar units on one hand and counting user's staff-assisted library use on the other. The measure has to be either how much material use or who use the material and/or staff assistance. Obviously the former cannot measure the latter, but the latter can measure both. Therefore, the common measure has to be the user. The more we are interested in user behavior, the more important the who-question becomes. This common measure will answer these questions: a) is every entitled library constituent user reached through library communication means? b) is everyone using some of the library service sometime? c) do we know whether individual users are satisfied users? d) do we know which user needs what services? e) how many users (differnet users) using how many books in and outside the library or libraries and how much staff assistance or guidance do they need? Thus the staff guidance is not to be given but to be requested individually as well as by formal courses, classes or groups. All these can be scheduled systematically and we can evaluate the results of these with a common measure which is the USER.

Taxonomy of profssional relations through personal contact and communication

A. One way, indiscriminate communications

5-1 Public relations and indiscriminate contact through mass-media

- -2 Radio announcement and/or radio book talk
- -3 Television announcement and/or TV library program
- -4 Newspaper articles

5-2 Library publications for distribution

- -2 Library guides, general information materials (including AV materials)
- -3 Library catalogs
- -4 Books by mail or mail-order catalogs
- -5 New acquisitions lists or similar lists
- -6 Subject guides, bibliographies, reading lists, etc.

B. Two way, individual contacts and communications

5-4 General purpose library orientation to groups

- -2 To children groups
- -3 To high school student groups
- -4 College freshman groups
- -5 College senior groups
- -6 Graduate student groups
- -7 Various adult groups
- -8 Professionals (teachers, professors, etc.)

5-5 Non-specific staff reader services

- -2 Written communication for selective dissemination of information, patron inquiries and requests for information and/or materials. This includes teletype and tele-fascimile communication.
- -3 Telephone communication for SDI, patron inquiries and requests
- -4 In-person, face to face communication for information, inquiries and requests for materials.

5-6 Systematic, specific purpose library instruction

Same groupings as #5-4

5-7 Specific purpose staff reader services for selection, suggestion or direct subject guidance

- -2 Written communication for such service
- -3 Telephone communication and contact for such service
- -4 In-person, face to face communication for such service
- -6 Contract research services

This taxonomy of professional contacts and communications is an attempt to enumerate and classify all possible relationships between the library users and the staff. Assumption here is that library use by an individual does not take place by accident. A library consciousness must be generated and nurtured throughout the school age and fully developed and cultivated throughout the creative period of college age, and fully refined throughout the productive adult age. Breadth and depth of library consciousness may be directly related to the ability and sophistication of library use. It could be maintained that the more conscious, the better use of the library. The user's library consciousness initiates and determines the kind and amount of library use. It can only be generated and cultivated by the library professionals, as it is entirely a library product.

The professional relations and communications, as enumerated in the taxonomy, are ranked in a descending order of increasing depth and commitment in professional relations. Thus the most casual, indiscriminate one-way mass communication is placed at one end of the spectrum and the utmost commitment and professional relation at the other end. A patron receives a combination of some or all of these contacts and communications, and a patron's individual profile or a group profile may be generated and used to account for and evaluate the results.

The library administrator must decide what kind of division of staff between public service and technical service will yield the best result, whereas the professional staff must allocate their time among these direct service activities as classified earlier in #5's and find out what combination of these yields the best results. As discussed earlier, the only feasible way to account for and evaluate the result is in terms of the user. This, however, presents a problem of how to account for the result generated by technical service staff. It seems that one feasible way would be to accountfor the actual use of library produced catalogs, bibliographies, etc., and to evaluate in terms of increased DDC of the library (or document delivery capability).

We have been discussing the feasibility of using one common library output measure that is meaningful and practical. Such a measure should be able to account for these: (1) the results of self-serviced use, like most of the inside the library use, (2) the results of indirect staff service, like book selection, cataloging, etc., and (3) the results of direct staff service, like reference or library instruction. The problem is partly how to express this common measure. It cannot be Exposure unit, because DE cannot measure the results of direct staff service, nor indirect staff service, although it can very well measure the patron's library use activities. So it should be in terms of individual users, and it should be able to measure all three.

Discussions thus far have identified and defined by development of taxonomies two aspects of material dimension and three aspects of intellectual dimensions, of which the last aspect culminates the whole discussion in the following hypothesis:

It is the library staff's taking initiative in their activities of individual patron contact and communication that will set the stage for or initiate subsequent library uses by the patron. More specifically, the staff activities of patron contact and communication will:

a) Make the patron conscious and fully aware of library services he can use,
b) help the patron formulate and articulate his problems to solve them by use of the library services,
c) help the patron use the specific library tools and guides designed for solving specific problems of users,
d) help the patron use the library most expeditously to his full satisfaction. In other words, help him accomplish his task most expeditously and accomplish more within a given time.

The traditional concept of library use by patrons is in reverse sequence, that is, it is the patron who initiates the library use, and there is no way of predicting which specific patron will come into the library at a given moment. The hypothesis proposed on this page reverses this order proposing that the staff should be the initiator and planner of the whole assortment of library use by individual patrons and patron groups, for observation of real situations suggests that the kind and amount of library use are largely determined by how the user conceives the library and staff services and by how the staff conceive the user's problems and ability. Logically the professionals should take the initiative.

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APPENDIX A. INSTITUTE PROGRAM

LIBRARY MANAGEMENT: QUANTIFYING GOALS

Fourth Annual Library Science Institute
On April 27-29, 1972
At Allendale Lodge, Terre Haute, Indiana
Sponsored by
Department of Library Science, Indiana State University

April 27, Thursday	
8:30 a.m.	Registration and Coffee at Allendale Lodge
9:00-10:15	Greetings by Dr. John Corrigan, Associate Dean College of Arts and Sciences Introduction by Dr. Choong Kim, Associate Professor Indiana State University
10:30-12:00	SAY NO TO THE STATUS QUO By Mr. Irwin M. Sexton, Director of San Antonio Public Library
12:00-1:00	LUNCH
1:10-3:00	EVALUATING GOALS FOR SCHOOL MEDIA PROGRAMS By Dr. Robert D. Little, Associate Professor and Chairman of the Department of Library Science, Indiana State University
3:30-5:20	NATIONAL IMPLICATIONS OF FEDERAL LIBRARY STATISTICS SURVEY By Dr. Frank L. Schick, Chief of Library Surveys Branch, National Center for Educational Statistics, U.S.O.E.
7:00-9:00	Informal reception at Holiday Inn
April 28, Friday	
8:30 a.m.	Registration and Coffee at Allendale Lodge
9:00-10:30	LIBRARY PERFORMANCE MEASUREMENT TECHNIQUES DEVELOPED FOR UNIVERSITY LIBRARIES IN ENGLAND By Mr. James L. Schofield, Assistant Director Management Research Unit, Cambridge University Library, England
11:00-12:30	QUANTIFICATION OF LIBRARY PERFORMANCE: REVIEW AND OUTLOOK By Mr. William H. Kurth, University Librarian Washington University, St. Louis, Missouri
12:30-2:10	LUNCH
2:30-5:00	DEVELOPING LIBRARY SERVICES FOR GRADUATE PROGRAMS: MODELS, PARADIGMS, AND QUANTIFICATION By Mr. Alan R. Taylor, Librarian for African Studies Indiana University
7:00-9:00	DEFINITION OF REQUIREMENTS FOR UNDERGRADUATE PROGRAMS IN UNIVERSITY LIBRARIES By Mr. Stanley McElderry, Dean Graduate School of Library Science, University of Texas, Austin
April 29, Saturday	
8:30 a.m.	Registration and Coffee
9:00-12:20	QUANTIFICATION IN FACILITIES PLANNING By Dr. David Kaser, Director of Cornell University Library
12:30 p.m.	Institute adjourns

APPENDIX B

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Indiana State University, Terre Haute, Indiana
April 27-29, 1972

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